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# Editorial

## Metronomic chemotherapy: an alternative and effective means of chemotherapy, ideal for developing countries.

In recent times Metronomic chemotherapy has emerged as one of the most promising chemotherapy regimen and has become a viable alternative to conventional regimes which has serious side affects and risk of drug resistance. It was in 2000, when two cancer research groups published a remarkable observation, in tumor-bearing rodents, low-dose chemotherapy, too low to evoke side effects or have a meaningful direct impact on tumor cells, when given on a daily or near-daily schedule, could markedly retard tumor growth [1,2]. This happened even in tumours which were resistant to chemotherapeutic drugs employed. The mechanism of such response was later ascribed to the chemotherapy drugs slowing or preventing angiogenesis.

Tumour cells secrete angiogenic substances, which cause rapid proliferation of extremely fragile endothelial cells to form new blood vessels in the tumour. Whereas the endothelial cells lining established vessels only rarely multiply, are stabilized by growth factors provided by neighboring cells, and are rarely killed by clinically feasible doses of chemotherapy drugs. The endothelial cells in the newly formed vessels, on the other hand, are extremely sensitive to killing by chemotherapeutic drugs, much more so than most cancer cells. Thus, when low-dose chemotherapy is administered on a daily schedule the continual death of endothelial cells attempting to form new blood vessels can substantially disrupt the angiogenic process, slowing it down notably.

Other researchers also noticed that traditional cytotoxic chemotherapy medicines, also had some anti-angiogenic activity when administered at low levels. This led to the concept of metronomic chemotherapy (known as "metronomic" because it is regular and even like the beat of a metronome): giving people long-term chemotherapeutic agents at relatively low doses, and with no drug-free breaks. The doses are low enough that side effects are not a major problem.



The metronomic chemotherapy philosophy stands as a different philosophy from the maximum tolerated dose (MTD) method typically used in conventional chemotherapy regimes, which employ higher doses of drugs often limited largely by the body's capacity to handle the side effects, and for limited campaigns of several weeks in order to avoid drug resistance and avoid harming the body's organs beyond a certain limit. Metronomic chemotherapy uses the conventional cytotoxic drugs but counts on them to stop or slow blood vessel growth. In other words, metronomic chemotherapy keeps on working when conventional therapy fails. So, there is hardly any drug resistance. However, the tumour may also increase production of pro-angiogenic factors that promote endothelial cells survival. This explains why cancers, which initially regress in response to metronomic therapy sometimes grow back despite continuing therapy. The cancer confers this relative resistance; not the endothelial cells themselves.

Another benefit of metronomic chemotherapy is that it tends to selectively kill a population of immune cells, called "T-reg" cells, that function to suppress the activity of immune cells capable of attacking the tumor. These are the natural killer (NK) cells and T-cytotoxic cells [3]. T-reg cells often congregate within tumors and secrete hormone-like factors that "turn off" the immune cells trying to attack the cancer. Thus, metronomic chemotherapy has emerged as a useful adjuvant to therapeutic strategies intended to boost the tumor-killing capacity of NK and T-cytotoxic cells [4,5].

Metronomic chemotherapy can also be useful when used in conjunction with conventional chemotherapy [6]. Another merit of this regimen is that it is essentially free of annoying side effects. Only a mild suppression of white cell count was observed in a small minority of the treated patients.

Another strategy cancer researchers are looking into is to cause the cancer to go dormant. This means the body still has cancer cells in it, but the cancer is not growing or a threat to overall health. It has been known since the 1970s that tumors without blood vessels can be dormant. There are suggestions that metronomic chemotherapy can help induce tumor dormancy, although this hasn't been proven.

One study has shown long-term responses of patients with metastatic breast cancer to a metronomic regimen involving daily cyclophosphamide (50mg) and two weekly doses of methotrexate (5mg per dose) [7,8]. 32% of the patients achieved either a complete or partial remission, or a stabilization of disease lasting at least 24 weeks. In about 16% of patients, no tumor progression was noted for over a year. Even in the patients in whom progression did occur, it seems likely that the therapy was often slowing the spread of the disease.



Since metronomic therapy is directed against endothelial cells, not cancer cells, a metronomic regimen that works well with one type of cancer should work well with all types of cancer dependent on angiogenesis for growth.

Dr. H.K. Dutta

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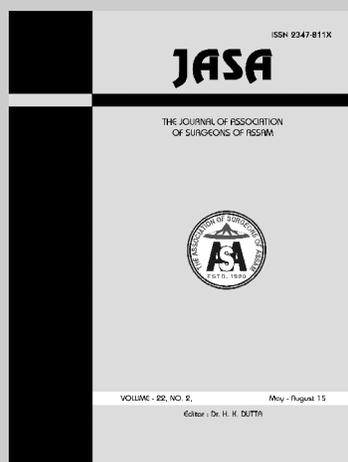
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## "Correlation of serum calcium & magnesium ratio with s.PSA, prostate gland weight & Gleason score in carcinoma prostate - a prospective, age matched control study."

### ABSTRACT

#### Background :

Prostate cancer (PC) is the most common non-cutaneous malignancy in Western societies and the second leading cause of cancer death in men. However, as yet no satisfactory marker have been found to detect PC at early stage. Earlier studies have shown significant correlation in the alteration of serum calcium and magnesium ratio with higher grades of PC. The present study is carried out to establish any significant correlation between the alteration of serum calcium and magnesium ratio with the prostate gland weight, rise in serum PSA level and the Gleason score, which have not been reported till now.

#### Materials and Methods :

Altogether, 54 patients presenting for the first time in our department with suspicious prostatic lesion on digital rectal examination (DRE) was taken up for the study. It was a prospective, age matched case-control study.

#### Results :

The highest number of patients were in the age group of 50-70 yrs (78.26%), followed by age group above 70 yrs (13.04%). Gleason score of 6 was seen in 10 cases (43%) followed by Gleason score of 7 in 8 cases (34%). The serum calcium and magnesium ratio did not show any correlation with the prostate gland weight and serum PSA level. Also, the grades of prostate cancer did not show any alteration in the calcium and magnesium ratio.

#### Conclusion :

Although there are a lot of discrepancy in the literatures regarding the alteration of serum calcium and magnesium ratio with Gleason score, the present study did not show any positive correlation between alteration of calcium and magnesium ratio with that of Gleason score, serum PSA and prostate gland weight.

**Key Words :** Carcinoma prostate; Gleason Score; serum calcium-magnesium ratio; serum PSA.

#### Introduction :

Prostate cancer (PC) is the most common non-cutaneous malignancy in Western societies and the second leading cause of cancer death in men [1]. Although, various markers have been investigated and identified to detect early carcinoma prostate, none of the markers are sensitive. Of late, few studies have shown a correlation between alteration in calcium magnesium ratio ( $Ca^{2+}/Mg^{2+}$ ) and prostate carcinoma [2,3]. However, whether such alteration

is influenced by histological grade of carcinoma prostate or prostate size is yet not known.

Magnesium in the normal prostate showed a uniform distribution and concentration. Although studies have shown multifold increases in  $Mg^{2+}$  concentration in the hyperplastic glands, magnesium was not demonstrable histo-chemically in carcinoma, and the chemical assay showed lower concentration than in hyperplastic tissue.

The biochemical mechanisms responsible for and associated specifically with the development and progression of PC are largely unidentified.  $Ca^{2+}$  has been shown to be essential for increased cell proliferation in prostate cells. However, the ion channel(s) involved in increased  $Ca^{2+}$  entry that can lead to an increase in cell proliferation is not fully understood. Importantly, early stage PC depends on androgens that are needed for its growth, and because these androgens also regulate  $Ca^{2+}$  entry, it can be anticipated that abnormal  $Ca^{2+}$  signaling may be an essential step towards increased cell proliferation and in the development of PC. In addition, besides  $Ca^{2+}$ , other ions such as  $Mg^{2+}$  also play a critical role in cell proliferation. However, the mechanism and the importance of the tight balance between these ions especially in PC is still unclear.

TRPM7 is a newly identified novel magnesium-nucleotide-regulated metal current (MagNuM) channel that is regulated by serum  $Mg^{2+}$  concentrations. TRPM7 is expressed in both normal and prostate cancer cells. However, age-matched PC patients have shown an increase in TRPM7 expression. There is evidence that the TRPM7 channel has an important role in PC [2].

A number of prospective studies have investigated the relationship between calcium and overall PC risk, with mixed results. Several studies investigating the relationship between calcium intake and the risk of aggressive or clinically relevant prostate cancers have generated both null and positive results. Recent studies have found higher serum calcium levels associated with aggressive lesions or fatal prostate cancer.

Considering these points, this study is planned to find out the extent of alteration in  $Ca^{2+}/Mg^{2+}$  ratio in patients with PC and to correlate whether such alteration has got any bearing on prostate weight, S. PSA and Gleason score.

#### Materials and methods:

The study was conducted in the Department of Urology, Gauhati Medical College and Hospital, Guwahati, Assam from January, 2013 to December, 2014 for a period of 2 years.

All elderly patients, presenting for the first time in our department with suspicious lesion in the prostate on digital rectal examination (DRE) or ultrasonography of prostate was taken up for the study. It was a prospective, age matched case control study.

S. Calcium and Magnesium level, S. PSA estimation were determined by standard analyzer available in the hospital. Prostate volume was measured by Transrectal Ultrasound (TRUS). Patients with suspicious prostatic lesion on DRE and/or S.PSA > 4ng/dl were subjected to TRUS guided biopsy to ascertain the presence of carcinoma and the Gleason grade assessed. The patients with the following disease were excluded from this study: Diabetes mellitus, urinary tract infection, prostatitis, prior prostatic surgery, cardio-vascular disease, patients of BPH on treatment, malignancies, renal failure, hyperparathyroidism, patients on Thiazide diuretics, vitamin A & D and patients with renal stones.

#### Results:

A total of 54 patients were taken up, of which 23 patients with carcinoma prostate were in the case arm and 31 patients without carcinoma prostate were taken as control arm. Both groups were subdivided according to the age distribution. Serum PSA level and serum calcium and magnesium levels were recorded in all the cases. Size of the prostate gland were assessed in all the cases taken up for the study. Patients who presented to us with a prior ultrasonography or who underwent TRUS prostate revealed hypoechoic areas within the prostate (Fig. 7 & 8). One patient presented to us with a mass lesion arising from the prostate which had infiltrated the bladder base, as was evident in the CT scan pelvis (Fig. 9). Diagnosis of adenocarcinoma was confirmed by TRUS guided biopsy and each patient was given a Gleason's score. The statistical analysis was carried out using SPSS version 15.0. Statistical analysis of the various age distribution between the case and control group were carried out using Anova test and were found to be non significant ( $p=0.573, 0.793$ ). Out of 31 patients in the control arm, 23 patients were randomly selected for statistical analysis. The control group patients were selected by age matched simple randomization protocol using computer generated random numbers. In our study, the highest number of patients were in the age group of 50-70 yrs (78.26%), followed by age group above 70 yrs (13.04%). In the age group of 50-70 yrs, majority of the cases were seen between 60-70 yrs (Table 1). Gleason score of 6 (Fig. 10) was seen in 10 cases (43%) followed by Gleason score of 7 in 8 cases (34%). 5 cases (21.73%) presented with Gleason score of 3+4, whereas 3 cases (13.04%) presented with Gleason score of 4+3 (Table 2). 9

patients(39.12%) presented with a serum PSA level of  $\geq 100$  ng/dl, of which 6 patients were in the age group of 50-70 years. 7 cases(30.43%) presented with a prostate gland weight of 41-50 grams. This study did not show any correlation between alteration of serum calcium and magnesium ratio with prostate gland weight and serum PSA level in carcinoma prostate patients. Also, the Gleason score did not influence any alteration in the calcium and magnesium ratio (Figs. 1-6).

Table 1. shows the incidence of carcinoma prostate among the various age groups:

AGE IN YEARS	No. OF CASES	PERCENTAGE
< 50	2	8.69%
50-70	18	78.26%
> 70	3	13.04%

Table 2. Shows the incidence of Gleason score:

GLEASON SCORE	No. OF CASES	PERCENTAGE
5 (3 + 2)	1	4%
6 (3 + 3)	10	43.47%
7 (3 + 4)	5	21.73%
7 (4 + 3)	3	13.04%
8 (4 + 4)	2	8%
9 (4 + 5)	2	8%



FIG. 1 Serum calcium: magnesium with Gleason score (control)

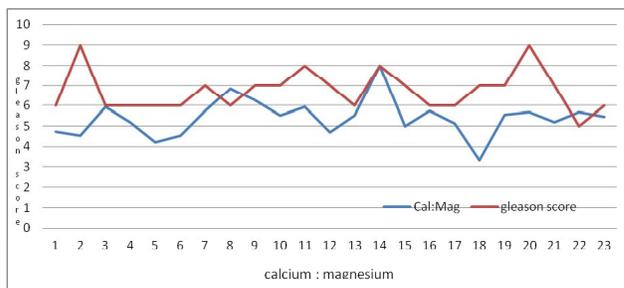


FIG. 2. Serum calcium: magnesium with Gleason score (cases) correlation coefficient,  $r = 0.10$ ,  $p = 0.6$ .

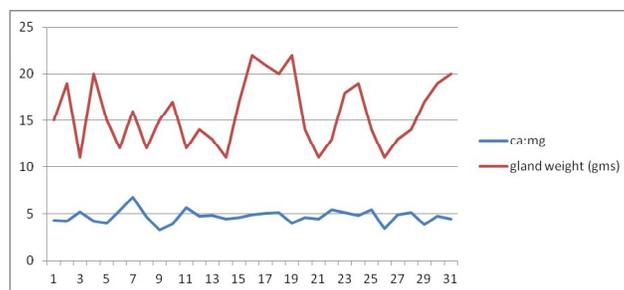


FIG. 3. Serum calcium: magnesium with prostate gland weight (control)

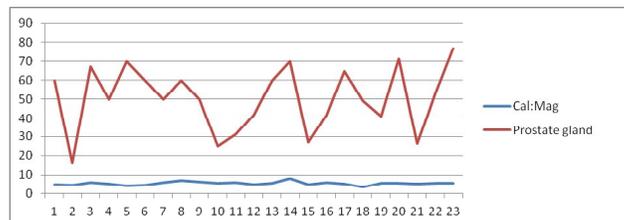


FIG. 4. Serum calcium: magnesium with prostate gland weight (cases) (correlation coefficient,  $r = 0.21$ ,  $p = 0.33$ )

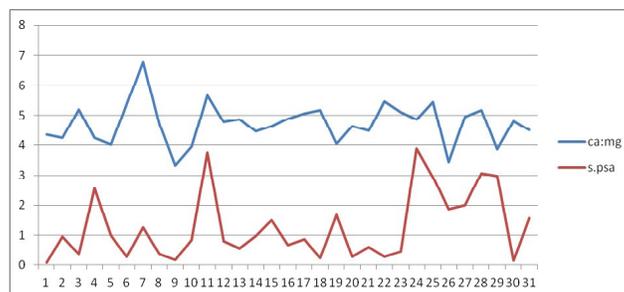


FIG. 5. Serum calcium: magnesium with Serum PSA (control)

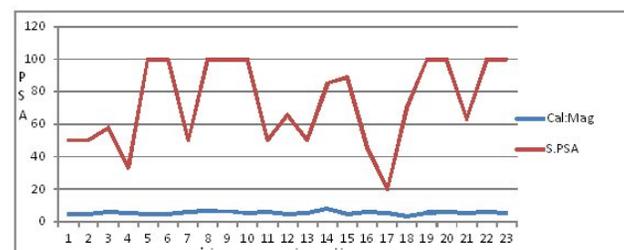


FIG. 6. Serum calcium: magnesium with Serum PSA (cases) (correlation coefficient,  $r = 0.16$ ,  $p = 0.46$ )

### Discussion:

Prostate cancer is the most common non-cutaneous malignancy worldwide, with a still unresolved etiology. Advancing age is a known risk factor. The population of India is now over a billion with an estimated 1.5 million cases of cancer diagnosed per year. Among those cases, PC accounts for 20/million/year [4]. The Surveillance, Epidemiology, and End Results (SEER) age-adjusted incidence rates of PC in 1990 were 45.2 per 100,000 men age 50 to 55 years,

337.5 per 100,000 for those age 60 to 64 years, and more than 1,000 per 100,000 for men older than 65 years [5].

Incidence of PC was extremely low for men younger than the age of 50, rose exponentially with advancing age and reached a maximum after age 80. In most countries, incidence in men over the age of 75 was 20-83 times higher than that for men ages 50-54 [6]. In a study carried out by Nath et al to estimate PC incidence in Gangetic zone and the non- Gangetic zone, maximum patients were seen in the age group of 56 - 75 years [7]. In the present study, the incidence of PC was found to be highest amongst the age group of 50-70 years (78.26%), followed by the age group of more than 70 years (13.04%).

Low et al reported that the highest number of patients with PC has intermediary value of Gleason's score (5-7) [8]. In a study of 241 patients with PC confirmed by biopsy, Roehl et al., reported that more than one-half of patients had clinically localized carcinoma and moderate differentiation with predominant intermediary Gleason's score of 6 [9]. A prospective study of 529 patients carried out by Coard & Skeete, showed that 36.9% of the patients with PC had a Gleason score of 6 followed by those with a Gleason score of 7 [10]. A study carried out by Lennox Anderson-Jackson et al, comprising of 191 men with prostate adenocarcinoma, moderately differentiated carcinomas (Gleason score of 6) comprised the largest group with 72 cases (37.9%); poorly differentiated cancers with Gleason scores of 8 - 10 comprised 49 cases (25.8%) [11]. The result of our study is also similar to the various earlier reports. In our study, Gleason score of 6 was seen in 10 cases (43.47%) followed by Gleason score of 7 in 8 cases (34.77%). 5 cases (21.73%) presented with Gleason score of 3+4, whereas 3 cases (13.04%) presented with Gleason score of 4+3.

Lennox et. al in their study reported that there were no significant differences between the PSA levels in patients with Gleason score of 6 compared with Gleason score of 8 and Gleason score of 6 compared with those of Gleason score of 9 [11]. In our study, majority of the patients (52.17%) presented with serum PSA in the range of 40-90 ng/dl, irrespective of the Gleason score. Only 9 patients (39.12%) presented with a serum PSA level of  $\geq 100$  ng/dl, of which 4 patients had Gleason score of 6 (3 + 3). Our results are consistent with that of the study by Lennox et al [11].

In a study carried out by Chen M.E. et al, on 180 patients with PC, the weight of the prostate glands ranged from 17 to 154 g. The mean weight was 42.2 g; median weight was 38.0 gram [12]. In our study, 7 patients (30.43%) presented with a prostate gland

weight in the range of 41-50 grams followed by 51-60 grams which is seen in 5 patients (21.73%).

Elevation of intracellular calcium levels in the presence of normal androgen levels has been implicated in apoptotic prostate cell death and the androgen receptor (AR) plays a critical role in the regulation of growth and differentiation of the prostate. Gong Y et al reported that intracellular calcium seems to be a potent regulator of AR gene expression in CaP cells [13]. Flourakis M et al reported that calcium ( $\text{Ca}^{2+}$ ) is an ubiquitous secondary messenger, involved in several processes such as apoptosis and proliferation and there are changes in  $\text{Ca}^{2+}$  homeostasis of the epithelial cells during PC evolution [14]. However, there are no reports which suggest any association between serum calcium and serum magnesium ratio with prostate gland weight. The present study did not show any significant alteration in the serum calcium and serum magnesium ratio with prostate gland weight.

Tollefson et al, on univariate analysis observed that the total serum calcium level was not significantly associated with any clinical or pathologic variables, including tumor stage, preoperative serum prostate-specific antigen level [15]. In this study the serum calcium and magnesium ratio was not altered with the rise of serum PSA level.

Smith et al concluded that no definite association of hypercalcemia with any histologic subtype of prostatic malignancy exists [16]. J. Hermosura et al provided evidence that PC cells are more sensitive to alterations in the  $\text{Ca}^{2+}/\text{Mg}^{2+}$  ratio [17]. Influx of both extracellular  $\text{Ca}^{2+}$  and  $\text{Mg}^{2+}$  needs to be tightly maintained for proper intracellular ion homeostasis. Hajnóczky et al and Rizzuto et al reported that alterations in this homeostasis is likely to increase cell proliferation and can lead to cancer [18,19]. Halcyon et al observed an approximately 3-fold increased risk for fatal PC among men in the upper level of the distribution of serum calcium. High serum calcium significantly predicted fatal but not incident PC [20]. Tollefson reported that the total serum calcium level was not significantly associated with any clinical or pathologic variables, including tumor stage, Gleason score [21]. Otley et al reported an increase in the serum  $\text{Ca}^{2+}$  to  $\text{Mg}^{2+}$  ratio and TRPM7 expression was observed in PC patients, further indicating that the serum  $\text{Ca}^{2+}$  to  $\text{Mg}^{2+}$  ratio, rather than individual  $\text{Ca}^{2+}$  or  $\text{Mg}^{2+}$  concentrations in the serum, is the deciding factor leading to the increase in cell proliferation. The results were also consistent with a recent report that also showed a higher  $\text{Ca}^{2+}/\text{Mg}^{2+}$  ratio in PC patients [21].

Yuyang Sun et al reported that the serum  $\text{Ca}^{2+}/\text{Mg}^{2+}$  ratio increased in PC patients, indicating that the

Ca<sup>2+</sup>/Mg<sup>2+</sup> ratio is perhaps critical for cell proliferation in prostate cancer cells [2]. Qi Dai et. al reported that there was a significant but weak inverse correlation between calcium and magnesium levels among PIN cases. The Ca/Mg ratio was found to be significantly higher among high-grade cases compared to controls. The Ca/Mg ratio was also higher among high-grade cancer cases compared to low-grade cases. Similarly, increasing magnesium levels were associated with a lower likelihood of being diagnosed with high-grade PC. The authors reported that serum magnesium levels, and the ratio of calcium-to-magnesium (Ca/Mg), was significantly associated with high-grade PC. Calcium levels alone, in contrast, were not consistently associated with PC or PIN. Interestingly, they found that low serum Mg was only associated with an

increased risk of high-grade PC, but not PIN or low-grade PC [22].

However, the present study did not show any positive correlation of alteration of serum calcium and magnesium ratio with Gleason score.

Conclusion :

Earlier studies have shown significant correlation in the alteration of serum calcium and magnesium ratio with higher grades of prostate cancer. Although there are a lot of discrepancy in the literatures regarding the alteration of serum calcium and magnesium ratio with Gleason score, the present study did not show any positive correlation between alteration of calcium and magnesium ratio with that of Gleason score, serum PSA and prostate gland weight.

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(A) Sagittal section



(B) Coronal section

FIG. 3. Serum calcium: magnesium with prostate gland weight (control)



(A)

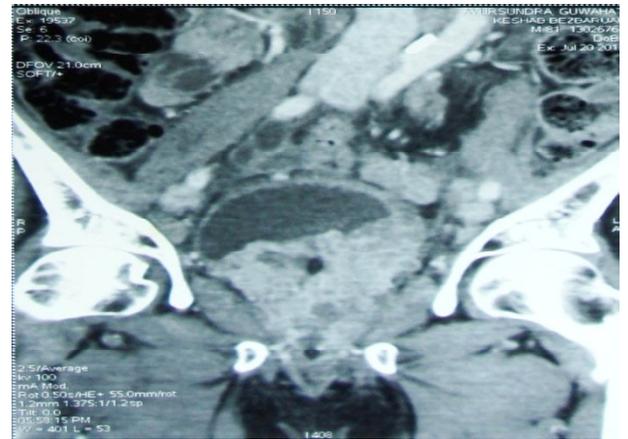


(B)

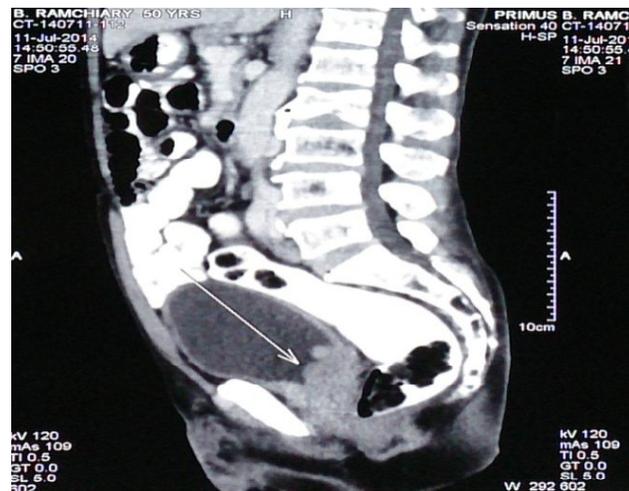
Fig.8: Trans-rectal ultrasonography of Carcinoma Prostate



(A) Axial section



(B) Coronal section



Sagittal section

Fig.9: Computed Tomography -Pelvis: carcinoma prostate infiltrating bladder base

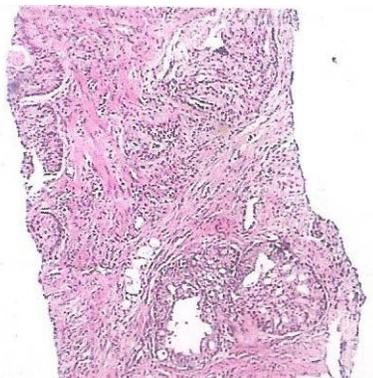
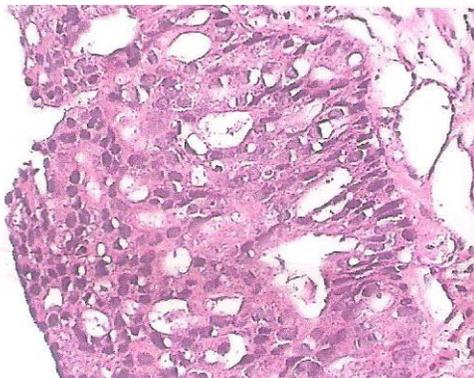


Fig.10: Histopathology of carcinoma prostate : Adenocarcinoma , Gleason score 3+3

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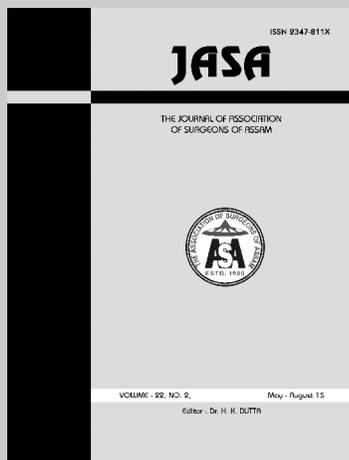
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## Clinical, endoscopic and post operative evaluation of children with EHPVO.

### ABSTRACT

#### BACKGROUND/PURPOSE :

Extrahepatic portal vein obstruction (EHPVO) in children can lead to severe bleeding from gastrointestinal varices, ascites, thrombocytopenia from hypersplenism, and other coagulation disorders. In this report clinical, endoscopic and radiological evaluation of a group of children and young adults were carried out and treatment outcome have been analysed in light of existing literature.

#### Methods :

20 children and adolescents were enrolled in the study. Patients with chronic liver disease were excluded from the study. Detail clinical examination of the patients, endoscopic assessment of the esophagus and stomach as well as radiological evaluation of the portal venous system and biliary tract were done. Operative findings were noted. Growth pattern of the study population was compared with age and sex matched control from the same population.

#### Results :

There were 8 boys and 12 girls. Umbilical catheterization, neonatal sepsis or intra-abdominal infection during neonatal period or infancy were noted in 6 patients. Hypersplenism was present in 7 patients and isolated splenomegaly in 3 patients. Although the weight and BMI of the cases and the controls were comparable, the height of the cases were found to be stunted as compared to the control group. Portal biliopathy was noted in 35% of the patients. Eighteen patients had evidence of varices in the present series. Gastric varices were noted in 15% of patients. Conservative management was opted for in 3 patients, who did not have bleed. 9 patients were treated with various shunt procedures. Postoperative complications were minor and included fever, variceal bleed and ascites in one patient each.

#### Conclusions :

Gastrointestinal bleeding is the commonest symptom of children with EHPVO. Most of the cases are idiopathic with no definite risk factors. Vertical growth stunting is common. Both EVL and shunt surgery are effective means of treatment in these patients.

**Key Words :** EHPVO; portal hypertension; varices; endoscopy; shunt surgery.

#### Introduction :

Extra hepatic portal venous obstruction (EHPVO) is defined as obstruction of the extra-hepatic portal vein with or without involvement of the intra-hepatic portal veins [1]. It does not include isolated thrombosis of splenic vein or superior mesenteric vein (SMV). There are features of recent thrombosis or of portal hypertension with portal cavernoma as a sequel of

portal vein obstruction. It is a common cause of portal hypertension (PHT) in the developing countries (up to 30% of all variceal bleeders) and is second to cirrhosis in the West (up to 5-10%). In this study an attempt is made to look into the clinical profile along with various modes of presentation of such patients, endoscopic assessment of the varices and radiological evaluation of the portal venous system and the biliary tree using ultrasound (USG), Doppler and MR portovenogram. Post operative outcome of the operated patients are analysed along with correlation with the various investigative procedures.

**Materials & methods :**

This study was carried out in the Department of Pediatric Surgery, Assam Medical College & Hospital, Dibrugarh, for a period of one year. All children and adolescents upto 18 years of age presenting with features of EHPVO were included in the study. Patients with cirrhosis and other causes of portal hypertension which were diagnosed subsequently were excluded from the study. A semi structured proforma was used and standard anthropometric indices were measured in each patient. The patients were entered into an extensive evaluation protocol that included routine clinical assessment and standard hematologic and biochemical investigations. Endoscopic evaluation was done using the Olympus EVIS EXERA II 180 video system, CLV-180 light source and the GIF-H180 gastroscope. Radiological evaluation was done using Doppler USG and dynamic contrast-enhanced 3-dimensional MR portovenogram. Splenic volume was measured from MR scans using appropriate volumetry software. In order to standardize the difference in the size of the patients, the splenic volume was expressed as a ratio, the splenic volume index, between the actual volume as measured on the MR scan and the body surface area of the patient. The splenic index could not be measured in one patient, who had splenectomy done before presentation. The growth pattern of the study group was compared to age and sex matched controls belonging to the same socioeconomic strata to evaluate the impact of the disease on the overall growth pattern.

**Results :**

Of the 20 children and adolescents enrolled, 8 were boys and 12 girls (age- 2 to 18 years; mean  $\pm$  S.D is  $9.6 \pm 4.08$ ). In 14 cases no definite risk factor could be ascertained. Three patients had history of umbilical catheterization for exchange transfusion during neonatal period, one had early onset neonatal sepsis, one had intra abdominal infection in the form of pancreatitis, and another patient underwent abdominal surgery for acute appendicitis.

**Table 1: Presenting Features**

Splenomegaly	15	75%
Variceal bleed	13	65%
Pain abdomen	6	30%
Ascites	3	15%
Jaundice	2	10%

Most of the patients had the first episode of variceal bleed in the first 6 years of life (Table 1). The mean age of first bleed was  $6.07 \pm 3.9$  years. Hypersplenism characterized by splenomegaly associated with cytopenia of one or more blood cell type was present in 7 (35%) patients and 3 (15%) patients presented with isolated splenomegaly as the only feature of EHPVO.

On comparing the height, weight and BMI of the patients with the control group it was found that there were no statistically significant differences in the weight and BMI between the cases and controls. However the height of the cases were found to be stunted, with statistically significant differences, when compared to the control group.

**Table - 2: Correlation of splenic index with Hb%, TLC and platelet count**

	Pearson r	95% confidence interval	p-value
Splenic Index & Hb%	-0.3087	-0.6692 to 0.1693	0.1984
Splenic Index & TLC	-0.2057	-0.6036 to .2743	0.3983
Splenic Index & Platelet count	-0.2162	-0.6105 to 0.2640	0.3740

Correlation between splenic index with that of Hb%, TLC and platelet count has shown an inverse relationship between them although it was not statistically significant (Table 2).

The hematological parameters were checked preoperatively and on 6<sup>th</sup> postoperative week in patients undergoing shunt surgery. It is seen that there is significant improvement in Hb% and TLC following surgery but no significant improvement in platelet counts (Table 3).

**Table 3: Pre and post operative hematological parameters**

HEMATOLOGICAL PARAMETERS	MEAN $\pm$ S.D		p-Value
	Pre operative	Post operative	
Hb%	8.322 $\pm$ 1.15	9.8 $\pm$ 0.78	0.0001
TLC	5488.88 $\pm$ 2648.31	6944.4 $\pm$ 2003	0.0491
Platelet count	94777.77 $\pm$ 44706.76	117500 $\pm$ 16690.45	0.1777

Portal biliopathy refers to abnormalities of the extrahepatic and intrahepatic bile ducts in patients with EHPVO. These include compression by paracholedochal collaterals on bile ducts resulting in displacement, narrowing, strictures, angulation, dilatations and irregularity of bile ducts. Extrinsic compression, ischemia, and a combination of both have been proposed as the possible mechanisms for this. In the present series, portal biliopathy was noted in 35% of the patients, out of which 10% were symptomatic (Table 4, Fig.1, Fig. 2a & 2b).

Table - 4: Portal vein status & varices on MR portovenogram

No. of Patients	Cavernous transformation of portal vein		Lower esophageal varices		Gastrosplenic varices		Retropertitoneal varices		Pericholecystic varices	
	n	%	n	%	N	%	n	%	N	%
PRESENT	19	95.0	16	80.0	18	90.0	12	60.0	14	70.0
ABSENT	1	5.0	4	20.0	2	10.0	8	40.0	6	30.0
TOTAL	20	100	20	100	20	100	20	100	20	100.0

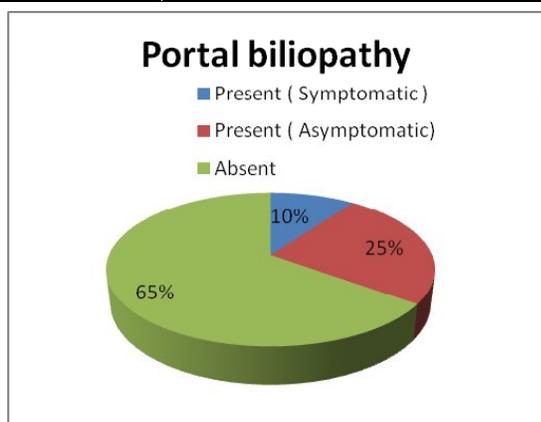


Fig - 1: Showing distribution of portal biliopathy in the study.

All the patients in the present study underwent UGI endoscopy, varices if present were graded according to Paquet's classification. Most of the patients were found to have a combination of two or more grades of varices, for our convenience the higher grade of varices were taken into account. Eighteen (90%) patients had evidence of varices in the present series, two (10%) patients did not have any varices and these patients did not give any history of hematemesis. Most of the patients with variceal bleed were found to have Grade III or IV varices. Out of 5 patients with Grade II varices only 2 patients had variceal bleed (Table 5). Gastric varices were noted in 15% patients and 5% of them did not have esophageal varices (Fig. 2).

Table - 5: Grading of esophageal varices

GRADE	NO. OF PATIENTS	PERCENTAGE
0	2	10%
I	1	5%
II	5	25%
III	8	40%
IV	4	20%
TOTAL	20	100%

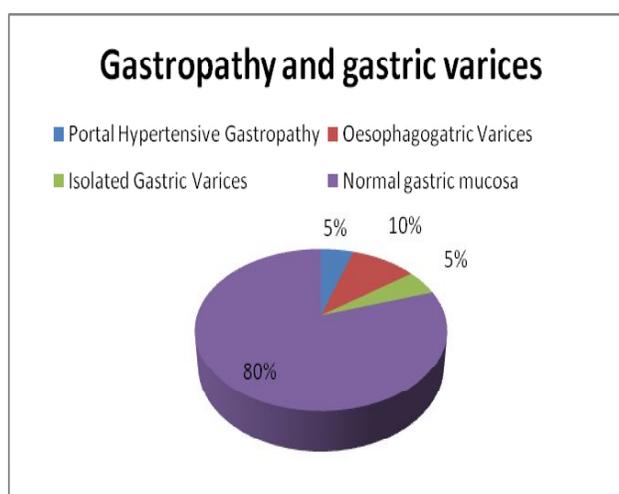


Fig -3a : Showing gastropathy and gastric varices in the study.

Table -6 : Treatment modalities adopted

PROCEDURE	NO. OF PATIENTS	PERCENTAGE
EST/EVL	8	40%
SURGERY	5	25%
EST/EVL + SURGERY	4	20%
CONSERVATIVE	3	15%
TOTAL	20	100%

Conservative management was opted for in 3 patients, two of them did not have varices and one had Gr I varices but no bleed. The patients were put on tablet propranolol and were periodically reviewed with endoscopy. Of the 9 patients who underwent operative treatment, 5 (55.6%) patients underwent mesocaval shunt (MCS), 3(33.3%) underwent mesorex shunt, and 1 (11.1%) underwent splenorenal shunt (SRS).

Table - 7: Findings at surgery

	MEAN	S.D
Age at surgery	8 years	± 3.618 years
Duration of surgery	4.3 hrs	± 1.11 hrs
Intraoperative blood loss	310 ml	± 65.82 ml
Intraoperative blood transfusions	422.2 ml	± 109.29 ml

Postoperatively 1 (11.1%) patient had fever and 1 (11.1%) developed ascites. UGI bleed was seen in 1 (11.1%) patient in the follow up period. The patients were evaluated with doppler USG and MR portovenogram for the shunt status.

Table - 8 : Rebleed Rates Following Intervention

REBLEED	NO. OF PATIENTS	PERCENTAGE
FOLLOWING SURGERY	1	5.8%
FOLLOWING EST/EVL	2	11.8%
NONE	14	82.4%
TOTAL	17	100%

DISCUSSION :

EHPVO has emerged as one of the most common cause of portal hypertension in children . The patients usually present with episodes of variceal bleed with a well preserved hepatic function. Even though long-term survival and quality of life of patients with EHPVO are better than those with cirrhosis of the liver, recurrent variceal bleeding poses a continuing threat to this group of patients. Various reports from India have observed that children belonging to low and lower middle socio-economic strata are commonly affected by this condition[2].

Etiology of blocked portal vein remains obscure in a large proportion of patients. In India the majority of cases (up to 90%) are categorized as idiopathic [2]. Some important causative factors associated with EHPVO are umbilical vein catheterization, neonatal sepsis, abdominal intervention etc [3-5].

Various series reported splenomegaly and variceal bleed as the most common symptoms, which is also observed in this series. In the series of Shinde et al, pain abdomen and variceal; bleed were the commonest symptoms. One notable observation was that 10% of our patients had jaundice at presentation, which was not a common feature in other series [4,5] (Fig. 3a,b,c).

Table - 9: Presentations in various series

	Spleno- megaly	Variceal bleed	Pain abdomen	Jaundice	Ascites	Others
Present study, 2014	75%	65%	30%	10%	15%	-
Ferri et al. <sup>3</sup>	89.1%	52.7%	-	-	1.8	25.5
El-hamid et al. <sup>4</sup>	63%	44%	-	1%	4%	8
Weiss et al. <sup>5</sup>	43.3%	40%	-	-	-	23.2
Shinde et al. <sup>6</sup>	-	37.5%	(35%)	(5%)	(10%)	12.5

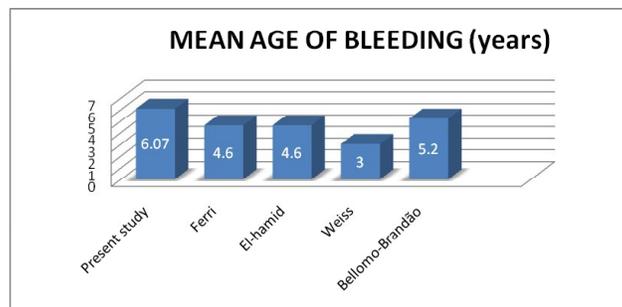


Fig - 3 : Showing mean age of first variceal bleed.

EHPVO in children is often reported to be associated with growth retardation. Reports from India indicated that the majority of Indian children with EHPVO were stunted compared to the national control or to the National Center for Health Statistics (NCHS) (USA) reference[7]. It also appears that the lean mass building is more likely to be affected than the fat storage. A report from Brazil reported that children with EHPVO had adequate growth for the age at diagnosis and over follow up period of 3.8 ±2.5 years compared to the NCHS reference [8]. Present study showed stunting of growth in the children affected with EHPVO.

Portal biliopathy, if present, often goes unrecognized (Fig.4). Upto one third of such patients may have jaundice [9,10]. Cholangiographic changes are evident even in children and it is speculated that portal biliopathy in EHPVO may be progressive in nature and would manifest clinically in adulthood[10,11].

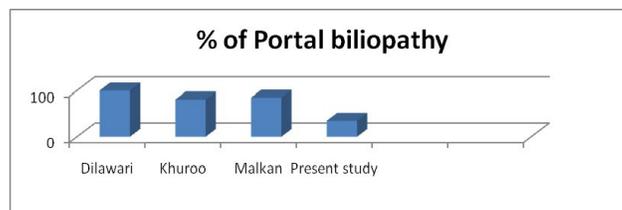


Fig - 4 : Portal biliopathy in various studies.

Endoscopic therapy is the first line of management in variceal bleed and EVL has become the preferred mode of treatment both in adults and children[2,12,13]. In the present study, 12(60%) patients were subjected to endoscopic therapy, of which 10 underwent EVL and two patients underwent sclerotherapy. Four of these patients needed surgery subsequently. Three (15%) patients in the present series were managed conservatively. Two had rebleeding following EVL. None of the complications of endoscopic therapy like ulcer or stricture were seen in the present study.

Table - 10 : Results of endoscopic therapy in various studies

STUDY	No. Of cases	Eradication (%)	Follow up (Months)	Rebleed	Complications	
					Ulcer (%)	Stricture (%)
Yachha et al [11]	50	88	19 (12-36)	26	20	6
Zargar et al [12]	69	91.3	120-240	11.9	-	-
Poddar et al [2]	257	95	36 (3-113)	11	17	18
Present series	20	83.33	3-12	2	-	-

Surgical management of EHPVO includes shunt and non-shunt procedures. The shunt procedures aim at reducing portal pressure by diverting the blood from the high-pressure portal venous system to the systemic circuit. The indications for shunt surgery include failure of endotherapy to control bleeding, presence of gastric or ectopic varices not amenable to endoscopic management, and with delayed sequelae like PBP and large rectal varices[14]. Emergency shunt surgeries have become a rarity in the era of endoscopic management. Other indications for shunt surgery include severe growth failure, massive splenomegaly, hypersplenism, rare blood group, isolated splenic vein thrombosis, non-compliance of elective EST/EVL and remote area of residence [15].

Shunts may be non-selective shunts or selective shunts, partial shunts and the more recently introduced "Rex shunt"[16]. The non-selective shunts enable complete decompression of the entire portal venous system by diverting total portal blood flow away from the liver. These shunts are end to side and side-to-side portacaval shunts, central lienorenal shunt, end to side mesocaval shunt and large diameter interposition portocaval or mesocaval shunts (Figures 5a & 5b). Although these shunts are effective in controlling variceal bleeding, encephalopathy is a concern in patients with poor liver functions.

In the present series 9 patients had been subjected to surgical management, the indications for surgery

were: recurrence of bleeding following EVL in two patients, portal biliopathy in one patient, hypersplenism with massive splenomegaly in one patient, five of the patients were from remote areas and had no access to health care centres in case of emergency.

Table - 11: Results of shunt surgery

	Agarwal et al [14]	Present study
No of operated patients	37	10
Type of Surgery	PSRS	Rex shunt, MCS, PSRS
Duration of surgery, mean	5.5 _ 1.6 h	4.3 ± 1.11 hrs
Intraoperative blood loss, mean	383 _ 318 ml	310± 65.82 ml
Intraoper. blood transfusions, mean	0.99 _ 0.98 U	422.2 ±109.29 ml
Fever, n (%)	12 (32.4%)	1 (10%)
Wound infection, n (%)	7 (18.9%)	None
Postop. intra-abd. bleed n (%)	1 (2.7%)	None
Ascites, n (%)	5 (13.5%)	1 (10%)

Following shunt surgery there was significant improvement in the Hb% and TLC parameters measured at 6th postoperative week but similar trend was not seen in case of platelet count. Similar observation was noted in studies by Ferri et al. and El-hamid et al [3,4].

Table - 13 : Outcome of shunt surgery in various studies

STUDY	Type of shunt	No. of patients	Shunt thrombosis	Rebleed	Mortality	Follow up (months)
Bismuth et al. <sup>15</sup>	CSRS, MCS, PCS	52	6%	2%	0	50
Orloff et al. <sup>16</sup>	CSRS, PSRS, MCS	162	2%	2%	0	5-35 years
Present series	Rex, MCS, PSRS	10	0%	1	0	3-12

Conclusion :

EHPVO is the commonest cause of portal hypertension and variceal bleeding in children. Predisposing factors were noted in a minority of the cases. Splenomegaly is the commonest symptom. Linear growth failure has been observed in a significant number of patients. EVL is effective in emergency situations and as a first line of therapy. Portal biliopathy and rebleeding following endoscopic treatment can be considered as indications for surgery. Patients living in remote areas who donot have easy access to health care facility are also candidates for surgery. EHPVO has a good prognosis and surgery provides a one time cure. Rebleeding following surgery is uncommon and can be managed by EVL.

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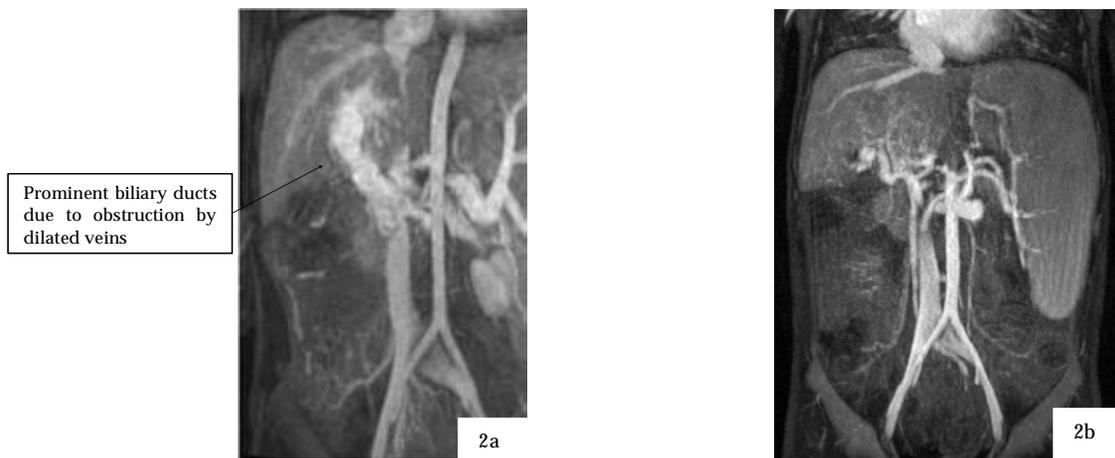


Figure 2a & 2b: Pre & post-operative MR portocavogram showing resolution of portal biliopathy

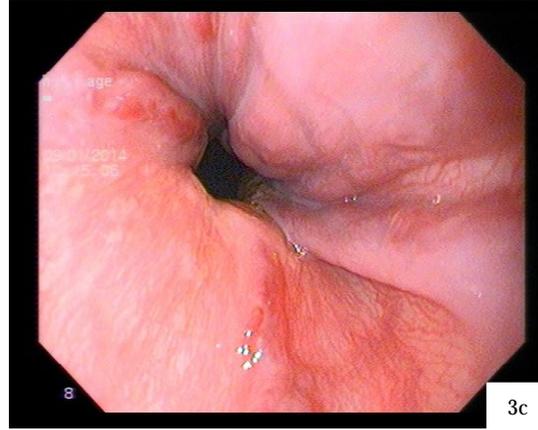


Figure 3b: EVL being performed in a patient; Figure 3c shows abolition of varices in the same patient after 6 months

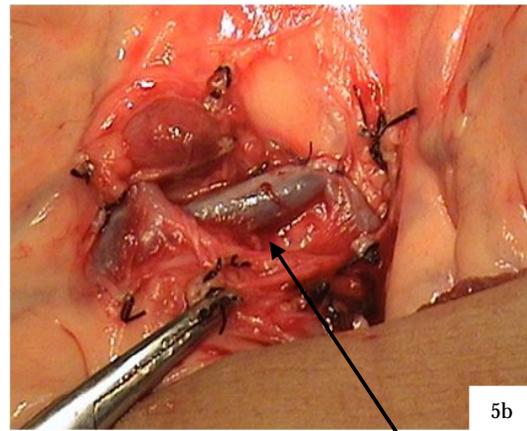
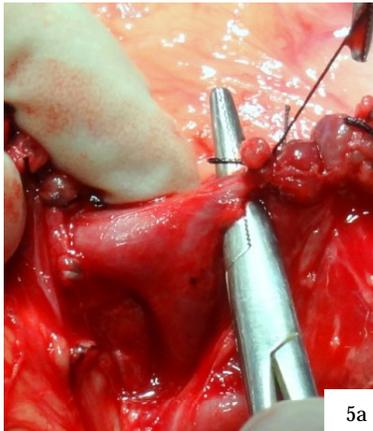


Figure 5a: mobilization of SMV for a mesocaval shunt;

Fig.5b: completed Rex- shunt

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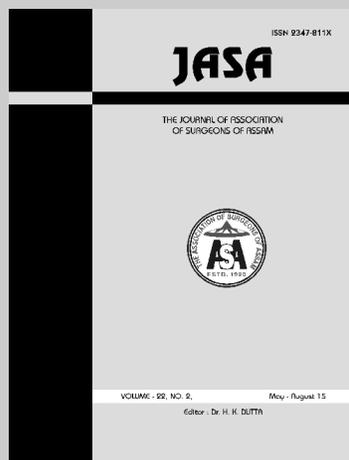
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## Antibiotics as primary therapy in Acute appendicitis- A Hospital Based Study.

### ABSTRACT

**Background :** Appendicectomy is the treatment of choice for acute appendicitis and is the most common surgery performed on acute abdomen. Despite use of modern diagnostic modalities appendicitis could be difficult to diagnose and there are reports of negative appendicectomy. In addition there are possibilities of post operative morbidity and many patients are not fit for surgery. The aim of this study was to investigate feasibility of antibiotics therapy in acute appendicitis in adults in a tertiary care centre.

**Materials and Methods :** In this hospital based study adults patients clinically diagnosed with uncomplicated acute appendicitis were included. One group of patients were treated with antibiotics therapy and the other group with emergency appendicectomy. The primary outcome of treatment efficacy was measured. The antibiotics group of patients were followed for one year for recurrence of symptoms.

**Results & Conclusions:** Primary treatment efficacy was 87.5% (p value: <0.0001; 95% CI: 0.724-0.953) in antibiotics group and 90 % (p value :< 0.0001; 95% CI: 3.5-22.9). in surgery group. There was primary treatment failure in 5 cases (12.5%; 95%CI 0.046-0.276) in antibiotics group and 4(10%; 95%CI: 0.033-0.246) in surgery group during first 24 hrs. Average hospital stay in both the group was 3 days. Time to resume work was longer in surgery group. There were minor complications in 3 cases (7.5%; 95%CI: 0.0196-0.214) in antibiotics group and 7 cases(17.5%; 95%CI 0.0789-0.334) in the surgery group. During one year follow up 2 patients reported with recurrence of symptoms and treated with appendicectomy amounting to total failure in 7 cases (17.5%). The cost involved was double in surgery group than that of Antibiotics group. Antibiotics as first line therapy could be offered as viable alternative to surgery in majority of adult patients with uncomplicated acute appendicitis.

**Key Words :** Acute appendicitis; antibiotics therapy; surgery.

### Introduction :

Acute appendicitis is the most common cause of acute abdomen. Appendicectomy is the treatment of choice in most of the centres and eventually this is the most common surgery performed on acute abdomen. Since the first study of acute appendicitis, appendicectomy has been proposed for its management [1,2] and widely accepted by surgical community. However, despite the use of modern diagnostic modalities appendicitis could be difficult to diagnose and there are reports of considerable number of negative appendicectomy. In addition there are

possibilities of post operative morbidity. Reports of conservative treatment have appeared since the middle of 20th century with low morbidity and mortality [3-5] although non operative management of acute appendicitis, with antibiotics remained a highly debated issue [5].

The aim of this study was to investigate feasibility of antibiotics therapy in acute appendicitis in adults in a tertiary care centre.

**Materials and Methods:**

Adult patients with clinical diagnosis of acute appendicitis were selected for this study. A number of 40 adult patients each in two groups were selected. Clinical diagnosis was confirmed with CBC, Alvarado score >6 and USG of abdomen. Patients with signs of defuse peritonitis, documented allergy to antibiotics; ongoing antibiotic therapy, associated pregnancy and suspicion of IBD were excluded from the study. One group was treated with antibiotics and the other group with appendicectomy at hospitalization.

Written consent was taken from all the patient before their enrolment and treatment protocol was explained .The study protocol was approved by the local ethical committee of the hospital.

Antibiotics were administered intravenously as primary therapy for 24 hrs along with other appropriate resuscitative measure in the antibiotics group. The administered antibiotics were penicillin group of drugs along with aminoglycosides and metronidazole in standard doses. Reassessment was done after 24 hrs. Patients with clinical and laboratory improvement were discharged in next 48hrs with the advice to continue oral antibiotics for six more days and followed for one year. These patients were advised to report immediately in the event of recurrence of pain abdomen. Patients not showing clinical and lab. improvement in 24hrs was taken up for rescue surgery. Similarly patients reported with recurrent pain during follow up were taken up for surgery at hospitalization and regarded as treatment failure. Intravenous antibiotics were continued post surgery as before. Oral medications advised at discharge for six more days.

Appendicectomy was performed according to established laparoscopic or open procedure. The same was followed for the patients not responding to antibiotic therapy as rescue procedure.

**Data collection and follow up:**

Pre-treatment data with body temperature, abdominal status, Laboratory status of CBC, USG abdomen were collected and analysed after 24hrs of antibiotic therapy. Duration of hospital stay, antibiotic

treatment, complications, rescue surgery, total cost of hospitalization and time to resume work were collected from each patient from both the group . Patents in surgery group were followed for 30days following discharge.

**Tables 1 : Clinical & Radiological signs**

Symptoms & Investigations	Antibiotics Group (%)	Appendicetomy Group(%)
RIF pain	40	35
Anorexia	23(58)	23(58)
Nausea ,Vomiting	12(30)	15(38)
Fever	9	9
Alvarado score	>6	>6
USG positive for Acute Appendicitis	34(85)	36(90)

**Table 2: Treatment Efficacy**

Treatment efficacy	Antibiotics: No.(% ;95% CI)	Appendicetomy: No (% : 95%CI)
Primary Hospitalization	35. (87.5%; 0.727-0.953)	36(90%; 0.754-0.960))
Recurrent symptoms(1Yr)	2.(5%; 0.018-0.118)	nil
Over all (1Yr)	33. (82.5%;0.672-0.926)	36(90%; 0.754-0.960))

**Table 3: Complications**

Complications	Antibiotic(n 40)	Appendicetomy(n40)
Bladder Dysfunctions		2
Diarrhoea	3	2
Wound Infections		3
Total	3 (7.5%)	7(17.5%)

**Outcome Measures :**

Primary end point was treatment efficacy and major complications. Efficient antibiotic treatment defined as clinical recovery during primary hospitalization and without recurrence of same symptom within one year. Efficient surgical treatment defined as positive clinico-pathological signs of acute appendicitis at exploration followed by appendicectomy. Major complications of abscess formation, reoperations, wound rupture, serious anaesthesia related problems were noted. Secondary outcome of minor complications related to antibiotics , wound infection following surgery, length of antibiotic therapy, duration of hospital stay, cost involved and time to resume work were noted. Statistical analysis was done applying Fisher's exact test using INSTAT and vassarstats software.

**Results :**

A total number of 40 patients selected for study in each group. There were 21 male and 19 female patients in antibiotics group and 15 male and 25 female patients in surgery group. 28 cases in antibiotics group and 23 cases in surgery group were found in age group of 21-40 years. Right Iliac fossa pain was the prominent symptom in both groups of patients followed by anorexia, nausea vomiting and fever. Abdominal USG was positive [Fig1,

2] for acute appendicitis in 34(85%) cases in antibiotics group and in 36(90%) cases in surgery group. Alvarado score was more than 6 in both the groups. [Table 1]. TC was more than 12000/mm<sup>3</sup> in both the groups. Duration of hospital stay was 3days in average for both the groups. Primary treatment efficacy in antibiotics group was found in 35 cases (87.5%) and 36(90%) in surgery group. At the end of study period there was treatment failure in 7 cases (17.5%) in antibiotics group and 4 (10%) in surgery group [Table 2]. The histological examination in 4(10%) found to be negative for acute appendicitis in surgery group. The average cost of antibiotics therapy in primary hospital care was Rs.1416/- and Rs.3024/- in surgery group. There was no major complication found in both the groups. There were minor complications [Table 3] of bladder dysfunction, diarrhoea and wound infections were encountered in surgery group (17.5%; 95% CI 0.08-0.36). Diarrhoea was the only morbidity found in antibiotics group (7.5%; 95% CI 0.01-0.21)

#### Discussion :

Appendicectomy has been considered primary means for treating acute appendicitis with a complication rate of 0.5 to 2.7% [6]. Post appendicectomy complications rate are typically around 10-19%[7]. Attempt to treat uncomplicated acute appendicitis with antibiotics has been studied recently. Increasing diagnostic accuracy has contributed to the use of this mode of conservative treatment [8, 9]. In this study the primary treatment efficacy was 87.5% in antibiotics group and 90% in surgery group which is in accordance with various other studies where the treatment efficacy were found to be from 65% to 90% in antibiotics group and from 17% to 100% in surgery group[10-12]. At the end of the study period it was found that 7(17.5%) patients in antibiotics group did not response to antibiotics therapy. In various other studies [10-12] 10.5% to 36.8% patients did so and reported with

recurrence. There was no complication in antibiotics group but in surgery group 10% complications were reported in one study [10]. In another study 12% and 13.7% complications were reported in antibiotics and surgery groups respectively [11]. In this study there was 7.5% complications in antibiotics group and 17.5% in surgery group. The hospital stay in both the groups of patients was not different in this study which was in accordance with similar study[9,12]. Time to resume normal activity is longer in surgery group(10days) but in case of antibiotics therapy it was found to be 5 days in this study. It showed that the recovery time was longer in surgery group [13]. The overall cost of medical treatment was found to be much less than that of surgical treatment [14]. Antibiotics related complications may be overcome by its rational use and taking care of any history of allergy [9]. There are reports of negative appendicectomy up to the rate of 20% [15]. In this study there was negative appendicectomy in 10% of cases. Two recent meta-analysis comparing antibiotics versus appendicectomy stated that the non operative group has low risk of complications than that of appendicectomy. However appendicectomy outperformed the non operative treatment in terms of overall treatment failure rate. It also concluded that antibiotics were safe as initial treatment of uncomplicated appendicitis with significant failure rate [16, 17].

#### Conclusions :

Appendicectomy remained gold standard in the treatment of acute appendicitis but the therapeutic effect of antibiotics and surgery were comparable. It is cost effective and reduces possibility of operative morbidity and ensures early return to work. It may be offered to the patients with acute appendicitis in adults as a viable alternative to surgery. The same is more applicable in treating those patients otherwise not fit for surgery.

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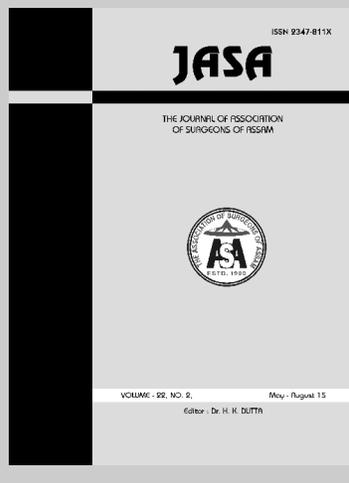
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## RESULTS OF OPEN REDUCTION AND INTERNAL FIXATION OF INTERCONDYLAR FRACTURES OF DISTAL HUMERUS WITH PARALLEL PLATING TECHNIQUE USING TRAP APPROACH

### ABSTRACT

For displaced intercondylar fractures of the distal humerus, treatment of choice is open reduction and internal fixation (ORIF) through a posterior approach. The triceps-reflecting anconeus pedicle (TRAP) approach has been described as a conservative surgical exposure for distal end of the humerus, and has been used in our study using parallel plating technique with Recon plate. 25 patients with intercondylar fracture of the humerus were operated and reviewed. 60% of the cases were operated within 3-7 days of injury, the mean time being 6.2 days. The patients were followed-up for a minimum of 12 months. The aetiology was mostly fall on the elbow. There were 15 female and 10 male patients and the average age of the patients was 41.3 years. The outcome was evaluated using Mayo Elbow Performance Score (MEPS). The overall average MEPS was 82. In our study overall satisfactory result (excellent & good) was obtained in 80% cases and fair in 20%. The mean range of flexion was found to be 118 degrees, while the mean range of extension loss was found to be 5.5 degrees. The mean range of supination was found to be 72.5 degrees, while the mean range of pronation was found to be 77.5 degrees. One patient had superficial skin infection and one case had a sterile discharge. Our results demonstrate that TRAP approach is extensile enough in treating these complex fractures and both articular reconstruction and fixation can be easily managed without creating olecranon fracture with good functional results.

**Key Words :** Intercondylar humerus fracture; TRAP approach; Parallel Plating; MEPS.

### Introduction :

Intercondylar fractures of humerus being a subgroup of distal humerus fractures, which involve the joint/ articular surface, constitute around 1% of all fractures[1]. Being an intra-articular fracture, intercondylar fractures of the distal humerus needs anatomic reconstruction and absolute stability as per AO/ASIF guidelines for early rehabilitation and to have a painless functional elbow. Therefore surgeon require approaches that provides adequate exposure of the fracture, and that protects the native anatomy with as little disruption as possible[2].

Even though there are several factors and controversial issues which influences the final outcome, the choice of implant, implant design, implant configuration as well as the surgical approach are closely related to the the

ultimate result and have been studied extensively over the last few decades[1].

Among a multitude of surgical approaches, trans-olecranon osteotomy is the most commonly employed approach which provide the best visualization of articular surface, though, it is associated with great deal of complications of its own. TRAP or triceps reflecting anconeus pedicle approach is a comparatively newer promising approach providing adequate visualization as well as loaded with less complications in contrast[3,4]. This involves combining the Bryan-Morrey and modified Kocher approach to reflect the triceps in continuity with the anconeus. It has the theoretical advantage of preservation of nerve supply to anconeus, adequate exposure and also avoidance of complications of an osteotomy[1].

#### Materials and method :

We selected 25 patients attending emergency department of our institute, with fresh(<3 wks old) closed intercondylar humerus fracture between the age 18-60, who gave informed consent for inclusion in the study and had intact neurovascular status. We excluded those who had polytrauma, those who had not given their consent and the patients who had medical contraindications for surgery.

The patients were between the ages of 25 to 59 years. The mean age was 41.3years with a standard deviation of 9.4 with the maximum number of patient in 41-50 age group. 15 patients were female and 10 were male patients. The most common side involved was left (60% cases) and there were no cases with bilateral involvement.

The most common mode of injury was fall on ground followed by RTA. The fracture was classified according to AO classification and most of them were type C2 (14) followed by C1 (9) and two C3.

Most of the cases (60.0%) were operated in 3-7 days following injury. The mean time interval between surgery and trauma was 6.2 days.

All of the cases were operated by posterior approach using TRAP approach and the fractures were fixed by using Recon Plate on both columns.

**Surgical Technique [1].**The surgical procedures were carried out by the same surgeon through the same technique. All patients were placed in lateral position, and the surgery was performed with the use of a tourniquet with shoulder elbow at 90° flexion. A

posterior midline incision over the olecranon was used; the ulnar nerve was routinely identified, tagged with a vessel loop, and mobilized proximal and distal to the ulnar tunnel. A triceps reflecting anconeus pedicle approach was chosen for all the cases in this series. The fixation was performed reducing the parts of the fracture to either the lateral or the medial column, using the Kirschner wires or screws, to finally complete the reduction of the two constructs under the olecranon.

The approach begins laterally at the Kocher interval, between the extensor carpi ulnaris and the anconeus. The anconeus is raised sub-periosteally off both its ulnar and distal humeral insertion while maintaining continuity with the triceps and its pedicle proximally. The lateral collateral ligament complex is at risk with this dissection and must be protected. The anconeus-triceps flap is then completed with subperiosteal dissection in a medial to lateral direction with elevation off the olecranon. Subsequently, a "tongue" of soft tissue consisting of the triceps and anconeus can be detached from the ulna and retracted proximally resulting in exposure of the elbow joint.

Upon reaching the fracture site, Kirchner's wires are used to reduce the articular fragments as joystick and then fix them provisionally. A transcondylar interfragmentary screw is inserted using a partially threaded 4mm cancellous screw to achieve a stable articular reconstruction. In case of extensive articular comminution; columns are reconstructed first one by one and the articular parts are not excessively compressed. Articular segment is reduced to the shaft and provisionally held with K-wires. Length of the plates was selected so that at least three screws could be placed in the humeral shaft both medially and laterally. Care was taken that the plates end at different levels proximally to avoid the creation of a stress-riser. Both plates are slightly undercontoured to provide additional compression at the metaphyseal region when applied. The plates are then fixed proximally and distally under maximum compression at the supracondylar level. Intraoperatively the elbow is checked for full range of motion (Fig a1).

The flap is then repositioned and repaired with no. 5 ethibond sutures through intraosseous tunnels and skin closure is done in layers after putting a drain (Fig a2). The limb is immobilised in an above elbow posterior anterior slab in full extension. The limb is kept elevated in slab for the first three days. Drain

was routinely removed on Day 2. After subsidence of swelling and subjective decrease in pain, the slab was removed and the limb put on an arm pouch. With this, gradual flexion extension exercises are begun within the limit of tolerance of pain. The patients are then discharged and called for follow up and suture removal at 10- 14th post operative day.

The patients were followed up according to a fixed protocol at an interval of 2, 6, 10, 14 weeks and then monthly. Serial Xrays were done and elbow ROM were checked as well as patients were evaluated by Mayo Elbow Performance Score

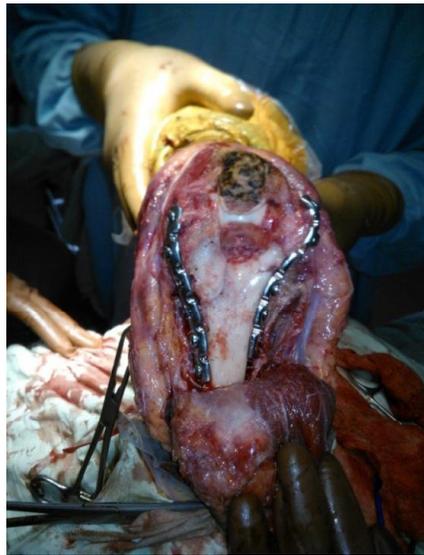


Fig.1: Intraoperative range of motion



Fig.2: Flap repositioning and fascial repair

#### Observations and results :

The mean range of flexion was found to be 118 degrees, (standard deviation 15.33) while the mean range of extension loss was found to be 5.5 degrees (standard deviation 3.09). The mean range of supination was found to be 72.5 degrees, (standard

deviation 10.8) while the mean range of pronation was found to be 77.5 degrees, (standard deviation 6.78). The range of motion at follow up is shown in fig a4.

The functional results were evaluated according to Mayo Elbow Performance scoring system (MEPS). With a maximum possible score of 100, the results are graded as excellent for scores >90; good for scores 75-89; fair for 60-74 and poor for scores less than 60.

The average MEPS for the 25 intercondylar fracture operated was 82. After calculating the MEPS for each of the patients, their final outcome was categorized into one of four groups as per the score. Satisfactory results were defined as those having "excellent" or "good" result. In our study overall satisfactory result (excellent+ good) was obtained in 80% cases with C1 having satisfactory result in all 9 cases while C2 having satisfactory result in 11 and fair in 3. The both C3 cases had a fair result.

A fracture was defined as healed when there was obliteration of fracture line and evidence of bridging trabeculae. All of the fractures united without the need for a second procedure, before 6 months. Thus the union rate was 100% with no delayed or non unions in the study. Fig a4 shows x-rays of union. The average time taken for union was 12.4 weeks.



Fig.3a & 3b: Flexion and Extension of affected elbow at 12 week follow up

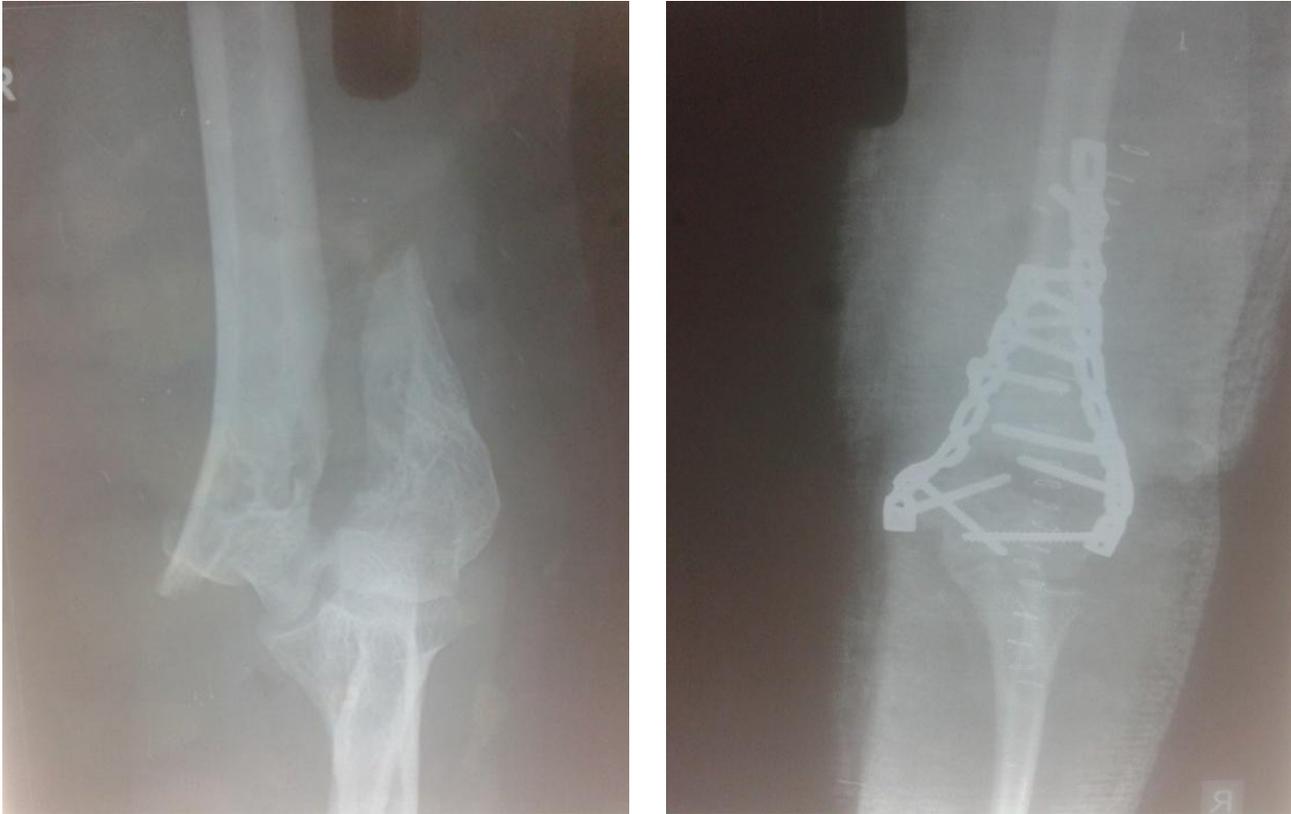


Fig. 4a & 4b: AP view of Xray showing intercondylar fracture humerus (pre operative and post operative)

1 case had superficial surgical site infection and one case had sterile wound discharge. The surgical site infection was debrided and put on i.v. antibiotics for 1 week after which it healed. The sterile discharge stopped by itself after four days; however the patient was put on empirical antibiotics.

#### Discussion :

Intercondylar humerus fractures are intra-articular fractures of distal end of humerus. As per AO guidelines, intra-articular fractures need anatomical fixation. It is now well accepted that satisfactory results can be obtained only when anatomical reduction and stable osteosynthesis is achieved and early physiotherapy instituted after surgery. Consequently open reduction and internal fixation is the gold standard of treatment of these fractures.

However there have been a lot of controversies concerning the most appropriate management of intercondylar humerus fractures.

Among them are

- a. The type of implant to be used, i.e. lock plate or recon plate.
- b. The configuration of the plates to be used, i.e. 90-90 or parallel.
- c. The procedure to be used while operating, i.e. olecranon osteotomy/ triceps splitting/ TRAP.

In our study we have kept the 1st two variables constant by using RECON plates in Parallel configuration in all cases and tried to find out the result of fixation of these fractures using TRAP approach.

We have found that TRAP is an excellent procedure for surgical exposure in case of intercondylar humerus fracture fixation which prevent us from having created a new fracture (olecranon osteotomy) and additional hardware problem used in the fixation of that. Wilkinson et al [2] concluded that the triceps splitting, triceps reflecting, and olecranon

osteotomy expose 35%, 46%, and 57% of the distal articular segment, respectively. In our study we hardly encountered any problem in fracture visualization and fixation, with respect to the approach, even in the communitated fractures.

At the end of six month we evaluated our results for each patient in terms of total Mayo elbow performance score and graded them accordingly. Overall we obtained "excellent" results in 40%; "good" in 40% cases; "fair" in 20% with a mean MEPS of 82. Therefore a satisfactory result was obtained in 80% cases. Table 1 shows comparision of mean MEPS in different studies on intercondylar humerus fracture.

Doornberg et al [3] and Soon et al[4] found "Satisfactory"(excellent+good) results in 86% cases whereas Sanchez-sotelo [5] and Reising et al [6]obtained the same in 80% cases. On the other hand "Poor" results were obtained in nearly 3% cases by Doornberg et al[3], Jupiter et al [7] and Soon et al [4] obtained the same in 10% of their cases.

AUTHOR(YEAR)	Approach used	Mean MEPS	RANGE
Doornberg 2007[3]	Mixed(TOO+ TRS)	9 1	55-100
Reising 2009 [6]	T O O	8 5	55-100
Schmidt-Horlohe 2013 [8]	T O O	8 5	50-100
Present Study 2013	T R A P	8 2	50-100

Table 1 Comparision of Mean MEPS

In our study we achieved similar results with respect to mean flexion, mean arc of motion and mean supination pronation arc compared to earlier studies. Our findings are consistent with those stated by Reising et al [6] and somewhat superior to that of Soon et al [4] in terms of range of motion. Moreover flexion contracture or extension loss was found to be much lower compared to most of the other studies. This is probably because of the approach itself, the early and proper physiotherapy and lesser number of C3 fractures in our study which is known to carry a guarded prognosis. Table 2 shows the comparison of results in term of range of motion in various studies.

AUTHOR	Approach used	Mean Flexion	Mean loss of Extension	Supination-Pronation arc
Soon2003 [4]	Mixed(TOO+ Campbell)	92.5(45-140)	-	-
Ring2004 [9]	T O	123(100-140)	2 7 ( 6 0 )	-
Doornberg2007[3]	M i x e d	129(95-145)	2 3 ( 0 - 1 0 0 )	1 6 5 ( 1 1 0 - 1 8 0 )
Reising 2009 [6]	T O	1 2 0	1 5	1 6
Present study	T R A P	118(95-140)	5 . 5 ( 4 - 2 0 )	1 5 0 ( 1 1 5 - 1 7 0 )

Table 2 Comparison of results in terms of range of motion

Conclusion:

From this study conducted on 25 patients with intercondylar fractures we came to the following conclusions:

The goal of surgical therapy in intercondylar humerus fractures being obtaining good fracture reduction and stable fixation to enable immediate function after treatment without the need for postoperative immobilization, open reduction and internal fixation is the gold standard of treatment. Choice regarding the procedure to be used has always been a controversial issue but one can clearly avoid an iatrogenic fracture as well as the morbidity related to hardwares in the form of its undue prominence by this approach. Moreover this approach has the advantage of better visualization of the joint while keeping the dynamic stabilizer of elbow (anconeus) intact. Even it might increase the quality of fracture reduction since the intact olecranon acts as a template for intraarticular reduction.

But there is clear indication for a detailed prospective randomized controlled study, involving a significant larger number of subjects for a longer duration, to prove the further clinical utility of this procedure in these fractures.

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# Case Report

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## OGILVIE'S SYNDROME IN A PATIENT WITH HEAD INJURY - A CASE REPORT

### ABSTRACT

Ogilvie's syndrome, or acute colonic pseudo-obstruction (ACPO), is a rare clinical entity that has been reported after certain medical or surgical conditions, but rarely in neurosurgical patients. It usually responds to non-operative therapy, but occasionally requires surgical intervention. We report a 50 year old man who developed ACPO during treatment of a significant head injury..

**Key Words :** Ogilvie's syndrome; acute colonic pseudo-obstruction; head injury; traumatic brain injury.

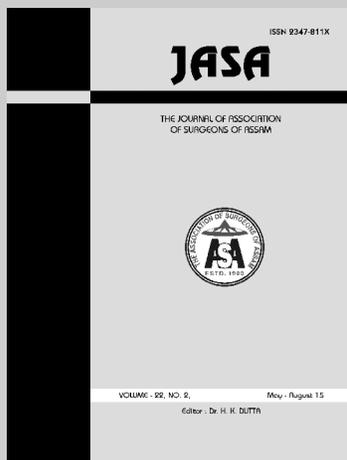
### Introduction :

Ogilvie's syndrome or acute colonic pseudo-obstruction (ACPO) was first described by Sir Heneage Ogilvie in 1948[1]. In an article in the British Medical Journal, he presented two patients with non-obstructive paralytic ileus. The colonic distension was considered due to imbalance between parasympathetic and sympathetic innervation caused by metastatic disease to the celiac plexus. Since then, several case reports and small series of ACPO have been described in association with many medical and surgical illnesses [2-9]. There is only 1 case previously reported of ACPO in a patient with traumatic brain injury [10]. We present a case of ACPO that developed in a patient who had a severe head injury following an alleged road traffic accident.

### Case Report :

A 50 year old man presented 24 hours after a road traffic accident with history of loss of consciousness and bleeding from the nostrils. On examination, he was conscious, his Glasgow Coma Score (GCS) was 11/15, and he was very restless. His vital parameters were normal. He also had fractures of the maxilla, and bilateral hemothorax which were managed by the Plastic Surgeon and the Cardio-thoracic Surgeon respectively. The CT scan of the brain showed a large right frontal contusion with bi-frontal pneumocephalus (Fig. 1). He was initially managed with anti-edema drugs, anti-convulsants, antibiotics and other supportive medications. 2 days later, his neurological status worsened and the GCS came down to 8/15. A repeat CT scan of the brain showed increase in the size of the contusions. He was then taken up for emergency craniotomy following which he improved and the GCS became normal.

3 days after the cranial surgery, he developed diarrhoea and abdominal distension with sluggish peristaltic sounds. He was initially managed with continuous naso-gastric drainage, intermittent flatus tube decompression



and intravenous fluids. Microscopic examination of the feces revealed bacterial infection and appropriate antibiotics were started. He also developed hypokalemia, which was corrected. The abdominal distension however kept on progressing, and he developed respiratory distress. An emergency CT scan of the abdomen was done which revealed highly distended colon, typical of Ogilvie's syndrome (Fig. 2). Intravenous Neostigmine was given, which within minutes, caused rapid decompression of the abdomen. Intermittent neostigmine was continued for 72 hours, after which the patient's condition stabilised.

#### Discussion :

Acute colonic pseudo-obstruction (ACPO) is an uncommon condition usually arising in elderly patients being treated for concomitant medical or surgical conditions. Medical conditions associated with the development of ACPO include sepsis, electrolyte abnormalities, myocardial infarction, respiratory failure, pancreatitis, burns, certain drugs and stroke [2,3,7-9]. Surgical conditions include obstetric or gynecologic procedures, orthopedic surgery and renal transplantation [4-6].

The precise pathophysiology involved in these various conditions is not well-known. In the original article written by Ogilvie, the colonic distension was thought to be due to imbalance between parasympathetic and sympathetic innervation caused by metastatic disease to the celiac plexus [1]. The mechanism involved in Ogilvie's syndrome associated with significant head injury is also unclear: whether it is a manifestation of subtle neuro-hormonal imbalances resulting from the head injury, electrolyte disturbances, or altered functioning of the autonomic nervous system is unknown [10].

The diagnosis of Ogilvie's syndrome is one of exclusion in an appropriate clinical setting. It is usually made in an elderly patient with other medical problems or in the postoperative setting. The symptoms are acute in onset and consist of abdominal distention, nausea, vomiting, and abdominal pain. There may be associated fever and constipation or diarrhoea. Physical examination reveals a distended tympanitic abdomen, abdominal tenderness and diminished bowel sounds.

It is imperative that mechanical colonic obstruction (such as fecal impaction, colonic or rectal tumor, cecal or sigmoid volvulus, and toxic megacolon) are ruled out by appropriate investigations.

The treatment of ACPO varies with the condition of the patient and the severity of the symptoms. Most patients will respond to non-operative treatment. This includes strict 'nil-per-oral', insertion of a nasogastric tube, intravenous fluid administration, correction of any underlying electrolyte abnormalities, and insertion of a rectal tube. Other adjunctive measures that have been effective in certain clinical situations include endoscopically placing a long tube into the proximal colon and the use of certain medications such as neostigmine and erythromycin to stimulate colonic activity [11-13]. Patients that do not respond to conservative measures or who develop signs of impending or actual bowel necrosis warrant immediate exploration [14]. The signs and symptoms that warrant consideration of operative intervention include an increasing white blood cell count, fever, worsening abdominal tenderness, and a cecal diameter of greater than or equal to 12 cm.

In our patient, the diagnosis was delayed as the initial fecal examination report suggested infective diarrhoea, and then the development of hypokalemia also contributed to the confusion. However, as the patient's condition worsened even after correction of these problems and the patient developed dyspnoea, an emergency CT scan of the abdomen was done, which confirmed the diagnosis. As routine conservative therapy had already been exercised, and he was in acute dyspnoea, intravenous neostigmine therapy was instituted which resulted in dramatic bowel decompression and recovery.

There are very few reports of neurosurgical patients who have developed ACPO. Cross et al described ACPO in a patient with a significant closed head injury [10]. Katzir et al described Ogilvie's syndrome in a 73 year old man following ventriculo-peritoneal shunt surgery for normal pressure hydrocephalus [15].

In the Indian context, Mehta et al from Thiruvananthapuram have published their results of 4 patients with hemorrhagic strokes who developed ACPO and were managed successfully with intravenous Neostigmine [9].

#### Conclusion :

A strong index of suspicion is necessary to diagnose ACPO in the proper clinical setting. Early diagnosis and management can give rise to good outcome.

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LEGENDS:



Fig. 1. : CT scan of the brain showing an intracranial contusion and pneumocephalus

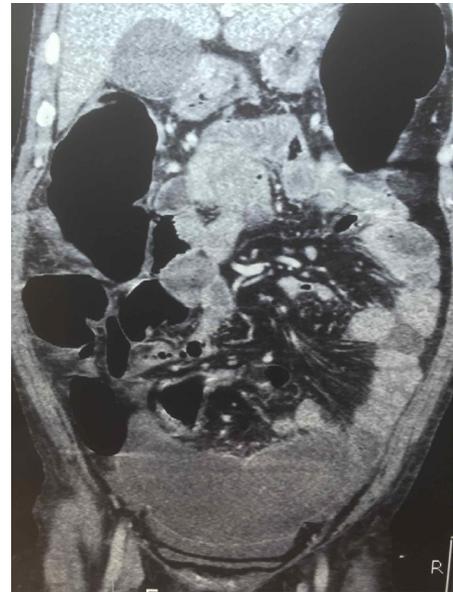


Fig. 2. : CT scan of the abdomen showing hugely dilated large intestine

# Case Report

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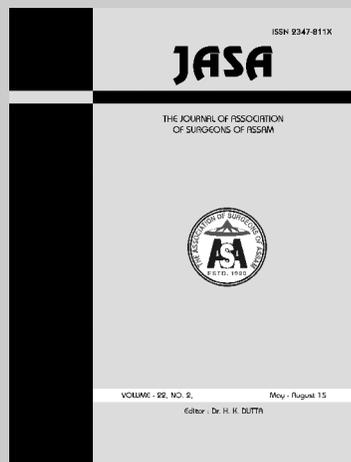
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## NON FILARIAL CHYLURIA WITH NEPHROTIC RANGE PROTEINURIA- A CASE REPORT

### ABSTRACT

Filariasis is the most common cause of chyluria in tropical country like India. Although non filarial chyluria is a rare condition, it needs systematic approach for evaluation and management. We report here a rare case of non filarial chyluria with nephrotic range of proteinuria and its management with endoscopic sclerosant therapy.

Key Words : Chyluria; filariasis; sclerosant.

### Introduction :

Chyluria is a condition characterized by the urinary excretion of chyle, which is a lymphatic fluid rich in chylomicrons. It is often associated with a nephrotic-range proteinuria. Chyluria is classified as parasitic or nonparasitic. The parasitic chyluria is mostly induced by *Wuchereria bancrofti*, *Echinococcus*, *Cysticercus cellulose*, *Ascaris lumbricoides*, *Tinea nana*, *Cercarinas hominis* and malaria. The nonparasitic causes can be congenital lymphatic malformation, injury to kidney with lympho-urinary fistulas and obstruction of the lymphatics caused by trauma, abscess, neoplasms, diabetes, pernicious anemia, pregnancy and tuberculosis.

### Case report:

A 44 years old female presented to the Department of Urology with complain of passage of milky urine for the last 20 years. Initially it was mild in nature, gradually increasing in frequency which showed exacerbation on taking fatty foods like egg, butter and mustared oil. She had no associated burning micturation, fever, weight loss and bleeding during micturation. She had no past history of any other significant medical or surgical condition like filariasis, malaria, tuberculosis, or any surgical intervention. On examination patient was anemic. No palpable lymphadenopathy was noted. Her eosinophil count was 15% with absolute eosinophil count of 512/mm<sup>3</sup> of blood. She had low serum protein and albumin and normal anti nuclear antibody. Serum triglyceride was normal. There was gross proteinuria (5.2 grams in 24 hours urine sample). ELISA for filarial and peripheral blood smear for microfilaria was negative. Her chest X-ray, USG and CT scan of abdomen and intravenous urography were normal. On retrograde pyelography there was pyelolymphatic and calycolymphatic reflux of contrast (Fig. 1).

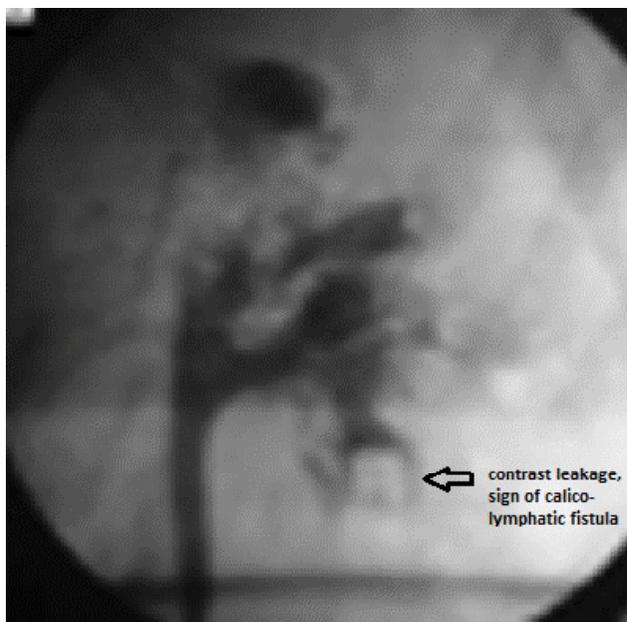


Figure 1: Retrograde pyelography

Lymphoscintigraphy, though indicated, could be not done as this facility was not available in our hospital.

Initially she was put on dietary restriction of fatty food without any response. Later endoscopic retrograde sclerosant instillation of 0.2% povidine iodine in 5% dextrose was done after high fatty diet on the previous day. Under cystoscopic guidance both ureteric orifices were catheterized and 0.2% povidine iodine was instilled into both ureters with the head end placed slightly low. Ureteric catheters were kept in situ for next 72 hours and povidine iodine was instilled 8 hourly under aseptic condition. Post endoscopic sclerosant therapy period was uneventful and on fourth day, the urine started becoming clear. The patient was discharged on 5<sup>th</sup> post therapy day and was called for follow up initially at one month and then at 6 months and thereafter yearly for 5 years.

#### Discussion :

Non filarial chyluria with nephrotic range of proteinuria is a rare condition. It can occur from any abnormal lymphatico-urinary fistula of kidney, pelvis, ureter, bladder, prostate, urethra with majority being reported at the renal level. The condition may be monosymptomatic or polysymptomatic. Careful evaluation to assess the etiological causes is important as prognosis of the nonparasitic chyluria is better than parasitic one and a 10-step protocol towards the diagnosis and management of chyluria is necessary [1]. In individuals with nephrotic range proteinuria with a normal or low lipid profile status along with normal serum albumin levels, urine color and nature, frequency of chyluria and assessing the urine for chyle can help identify the large subgroup who unnecessarily have to undergo kidney biopsy and at times are treated with immunosuppression, which is useless in these patients [2]. It is important to emphasize the need to manage the patient from a broader perspective, which goes beyond the medical aspect, involving also social and nutritional view points. In the great majority of cases, controlling chyluria is fundamentally based on patient education and adjustment to a low lipid, high protein diet in addition to increased fluid intake[3]. Many therapeutic options have been proposed including medical, endoscopic sclerosant therapy, surgical lymphatic disconnection such as nephro-lympholysis, uretero-lympholysis, hilar vessel stripping, fasciectomy and nephropexy, microsurgical procedure (transinguinal spermatic lymphangiovenous anastomosis or inguinal lymph node-saphenous vein anastomosis). Sclerosant solution instillation into the renal pelvis and laparoscopic renal pedicle disconnection are the invasive procedures most commonly employed. Among the medical alternatives, a low-fat diet supplemented with medium-chain triglycerides is often followed by complete clinical and biochemical remission [4].

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# Case Report

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## Intraoperative Diagnosis and management of a large retroperitoneal Paraganglioma - A case report

### ABSTRACT

Paragangliomas arise from neuroectodermal cells of the autonomic nervous system and are found in adrenal or extra-adrenal locations from neck to the pelvis. When found within the abdomen, a silent paraganglioma may be mistaken for retroperitoneal tumors. One of the most common extra-adrenal location is the organ of Zuckerkandl, a small mass of chromaffin cells derived from neural crest located along the abdominal aorta. We report a case of retroperitoneal paraganglioma occurring in a middle aged women, which was diagnosed at laparotomy and was successfully excised.

**Key Words :** Paraganglioma; pheochromocytoma; neuroectodermal tumour; catecholamines.

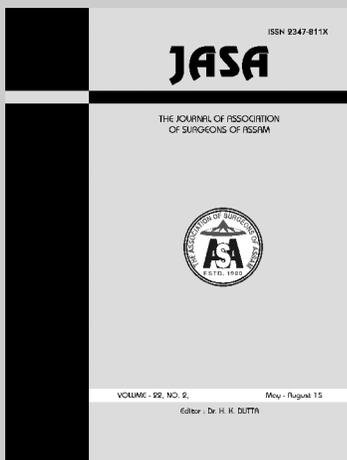
### Introduction :

Paraganglia make up dispersed neuroendocrine system near or in the autonomic nervous system. They have a roughly symmetrical distribution with extension from skull base down to pelvic floor. Paragangliomas are extra-adrenal chromaffin tumors that arise from neuroectodermal cells of the autonomic nervous system. When found within the abdomen, a silent paraganglioma may be mistaken for retroperitoneal tumors [1]. Paraganglioma or extra adrenal pheochromocytoma constitutes 10-25 % of all pheochromocytomas. Though the triad of headache, episodic sudden perspiration and tachycardia is a classic hallmark, more than 20% of patients can be asymptomatic [2].

### Case report :

We present a case of 48yr old lady who presented with lump abdomen since 5 months, with mild dull aching pain without any history of headache, palpitation or abnormal perspiration. Her bowel habit, micturation, appetite were normal. No abnormality was found on per rectal examination. The patient had hypertension (150/90) which was controlled on amlodipine 5mg OD.

On CECT a well defined lobulated heterogeneously enhancing mass lesion with areas of necrosis measuring 12.4X3.3X6.1cm was noted in the right paraaortic region displacing the right Kidney & inferior vena



cava (IVC) posteriorly (Figs.1a &1b). Both kidneys and adrenals were normal. Features suggests possibilities of retroperitoneal tumor probably sarcoma. Preoperative routine blood examination, chest X-ray & ECG were normal. However no investigation was done for extra adrenal pheochromocytoma.

Intraoperatively right upper paramedian incision was made. Mobilization of ascending colon and hepatic flexure was done. Immediately when the tumour was mobilized, BP rose to 230/130 mm Hg. Anaesthetist suspecting release of catecholamines from pheochromocytoma started the IV labetalol. BP was maintained at around 140/90mm hg with minimal fluctuations during operation. Tumor was mobilized from the retroperitoneal tissue including 2nd and 3rd part of duodenum, IVC, right renal vein, right ureter, and aorta by ligating and dividing multiple feeding vessels. The tumor was removed en masse. It was a well circumscribed lobulated mass of about 13x4x7 cm, brownish in color, cut section showed multiple cystic spaces (Fig. 2). Biopsy showed tumor cells with round to oval finely granular basophilic cytoplasm with prominent nucleoli, arranged in nest separated by fibrovascular stroma suggestive of pheochromocytoma (Fig. 3). Post operatively the BP was maintained around 150/80 mm Hg. Estimation of urine VMA, serum metanephrines and serum nor-metanephrines reached upper limit of normal by 17<sup>th</sup> post-operative day. Follow up with MIBG scan was required as metabolites were within normal limits. At last follow up, the patient is doing well with no evidence of any recurrence.

Discussion: :

Paragangliomas are extra-adrenal chromaffin tumors that arise from neuroectodermal cells of the autonomic nervous system. When found within the abdomen, a silent paraganglioma may be mistaken for retroperitoneal tumors [1]. According to Glenner, extra adrenal paragangliomas (EAP) can be classified as those associated with great vessels of chest and neck (branchiomeric origin), associated with the vagal nerve (intra vagal), associated with the aortic sympathetic chain of thoraco-lumbar region from the aortic arch to the urinary bladder (Aorto sympathetic) & associated with visceral organs (visceral autonomic group). Paraganglioma may arise in any portion of the paraganglion system most commonly

occur below the diaphragm, frequently in the organ of Zuckerkandl, a small mass of chromaffin cells derived from neural crest located along the aorta that begins cranial to the superior mesenteric artery or renal artery & extends to the level of the aortic bifurcation or just beyond. Typically it is located at the origin of the inferior mesenteric artery.

EAP can be both functional & non functional. Majority of EAPs that occur below diaphragm are functional [6]. Signs and symptoms may be extraordinarily variable with sustained hypertension or paroxysmal hypertension or sustained hypertension with superimposed paroxysms, headache, palpitation, sweating, tremors & anxiety [9]. In our patient, considering her age, the hypertension was thought to be essential hypertension before surgery. Catecholamine crisis can lead to heart failure, pulmonary edema, arrhythmias & even intracranial hemorrhage. EAPs & pheochromocytomas have some important clinical differentiating points like common age group for sporadic EAPs is 5<sup>th</sup> - 7<sup>th</sup> decades of life with a slight female predilection. EAPs affect patients in the 2<sup>nd</sup> & 3<sup>rd</sup> decade of life, with genetic tumors & male predilection [6]. More than 20% cases can be asymptomatic [2]. It occurs in 2 forms- sporadic & hereditary. 10-25% of pheochromocytomas can be extra adrenal [3]. Over 1/3rd of extra adrenal pheochromocytoma cases can be malignant. Currently malignancy is defined as presence of clinical metastases.

Sensitivity for diagnosis of paraganglioma is highest (97-99%) when plasma-free metanephrines & urinary fractionated metanephrines are present. Specificity was highest for urinary vanillyl mandelic acid (95%) and urinary total metanephrines (93%). Combination of MRI and MIBG (meta-iodobenzyl guanidine) was 100% sensitive and 100% specific.

Biphasic CECT (CT with contrast) & CEMRI (MRI with contrast) are important diagnostic tool for the retroperitoneal masses as characterization & assessment of the extent of disease as well as involvement of the surrounding structures can be evaluated. Multiplicity & small lesions can also be detected. A specific diagnosis might be difficult to determine because of overlapping imaging appearances. Presence of certain characteristic imaging features, with clinical correlation helps in narrowing the differential diagnosis [7]. A

heterogeneous, hypervascular retroperitoneal mass with areas of necrosis in a proper clinical settings is highly predictive of EAPs. CT features of EAP overlap with other Retroperitoneal masses. Particularly tumors of neural or mesodermal origin & metastatic disease must be considered [6,7]. Except for better tissue characterization & lack of radiation hazards, MRI does not have any other advantage over CT [8].

The traditional treatment of pheochromocytomas and EAPs consists of open exploration and resection [4]. International symposium on pheochromocytoma, 2005 recommends that all patients with pheochromocytoma and abnormal metabolic evaluation should undergo- alpha blockade; beta blockade; calcium channel blockade; catecholamine synthesis blockade and intravascular volume management. Repeat metabolic testing should be performed approximately after 2 weeks.

Lifelong annual biochemical follow up is mandatory for all patients [4].

#### Conclusion :

EAPs commonly arise in the organ of Zuckerkandl and represent at least 15% of adult and 30% of childhood pheochromocytomas. Imaging modalities help in the surgical planning & can be used as a screening tool for patients with hereditary syndromes. A silent paraganglioma may be mistaken for retroperitoneal tumors. If possible a USG guided FNAC should be done. Suspicion of paraganglioma should be kept in mind when operating on a retroperitoneal mass. As there is very high intraoperative mortality due to hypertensive crisis, very strict management of fluctuating blood pressure should be done and anaesthetist should be informed beforehand.

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Fig.1a: Heterogeneously enhancing mass with areas of necrosis in the right paraaortic region



Fig.1b: Mass displacing IVC & right kidney posteriorly.



Fig.2: Resected specimen & cut section of the mass.

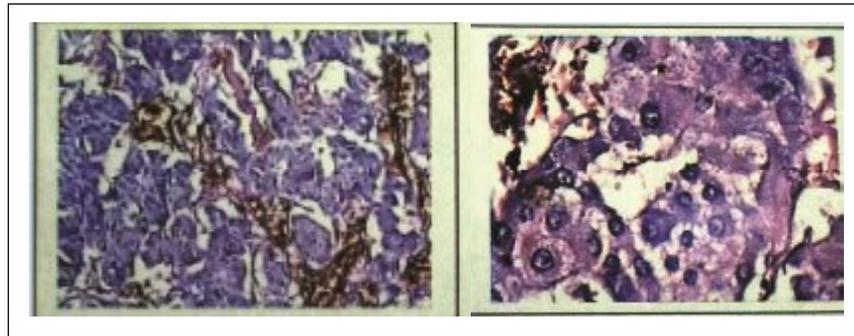


Fig.3: Photographs of histological section showing, tumor cells with round to oval, finely granular basophilic cytoplasm & prominent nucleoli, arranged in nest separated by fibrovascular stroma suggestive of Pheochromocytoma.

# Case Report

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## TOTAL DUPLICATION OF LARGE GUT- A CASE REPORT

### ABSTRACT

Total colon duplication is a rare entity and usually associated with anomalies of other systems. Majority of the patients present in early childhood. We present a sixteen year old girl, who presented with passage of stool through both anal and vaginal orifices. Although the symptoms were present since birth, the patient sought treatment only at this age. On investigation, she was found to have total colonic duplication, bicornuate uterus and one duplicated colon joining the vaginal orifice. The patient was successfully treated.

**Key Words :** Duplication; colon; alimentary duplication; bicornuate uterus.

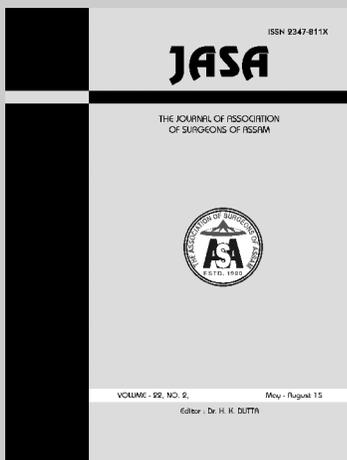
### Introduction :

Total duplication of colon is a rare congenital anomaly of the alimentary tract occurring anywhere from the mouth to anus [1]. Usually asymptomatic, it can present with obstruction, perforation, bleeding or malignancies [2-5]. Despite a variety of early descriptions, Ladd coined the term alimentary tract duplications in 1937, which described the clinical and pathologic aspects of these lesions more effectively [6]. Though several embryonic origin theories have been put forward, none of them fully explain the full diversity of the anomalies. Although they can occur at any age, more than 80% present before 2 years of age [7]. Colorectal duplications occur in 13% of these cases [8].

We present the case of a girl with total colonic duplication with double uterus, presenting with ectopic accessory anal opening.

### Case report :

A 16 year old girl presented in the OPD with complaints of passage of faecal matter through her vagina. She had the symptoms since birth, but as she was now approaching her marriageable age she came to the OPD. She was admitted and investigated thoroughly. Her physical examination did not reveal any abnormalities. Colonoscopy was done through normal anal opening and was found to be normal. The colonoscopy was then repeated through the vaginal opening, and it too revealed a normal colon. A double-contrast barium enema done through both the openings revealed double colon [Fig 1].



Other organs and the spine were normal. Her chest X-ray was normal. Her biochemical examination was normal. CT abdomen shows two luminal structures [Fig.2]. She was planned and put up for surgery.

On laparotomy, there was totally duplicated colon, with two cecum and two vermiform appendices [Fig.3]. Even the terminal ileum was duplicated and there was bicornuate uterus [Fig.4]. The colon had a single mesentery, lying side by side. The colon opening into the vagina was slightly bigger calibre. The colon which opened in to the vagina was divided as low as possible [Fig.5]. Multiple enterotomies were done between the two colonic tubes. Biopsy of the colonic walls of the two tubes revealed normal colonic layers. Her post operative recovery was uneventful, except for mild anastomotic leak, which healed on conservative management. The patient is being followed up for last 18 months. She is gaining weight, with normal bowel movement through normal anal opening. She complained of colicky pain abdomen occasionally which got relieved on simple medications.



Fig.3: Double caecum with two vermiform



Fig.4: Bicornuate Uterus appendices.



Fig.1: Barium enema showing colonic duplication.



Fig.2: CT showing colonic duplication

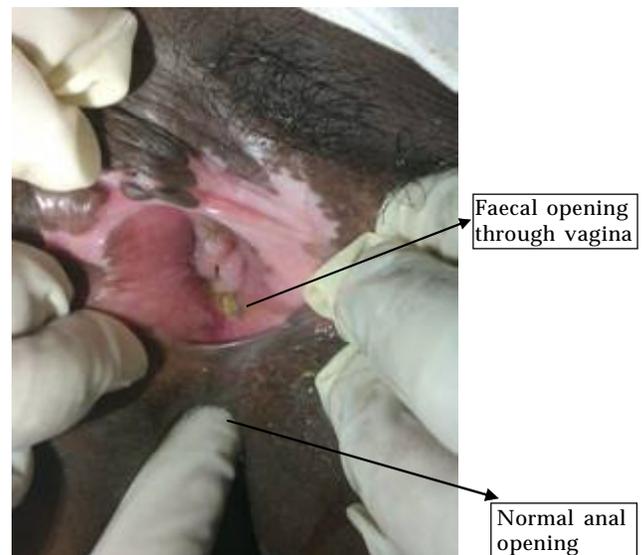


Fig.5: Two anal openings.

Discussion :

A number of terms have been used to describe accessory structures of the gastrointestinal tract- duplications, reduplications, colon duplex, enterogenous cysts, enteric cysts and giant diverticula. True replications are however best termed as duplications.

Duplications have the following characteristics [9, 10]-

1. A continuity or adherence to some part of the GIT.
2. Presence of smooth muscle coat.
3. A mucosal layer similar to stomach, small intestine or colon.

Intestinal duplications occur mostly in the paediatric age group. Colonic duplications account for 4-18% of them [11]. Eighty percent of these patients can have associated anomalies, most commonly of the genital and urinary tract, others being of the spine and clubfoot [12]. Complete duplication of the colon and rectum can be accompanied by doubling anomalies of the urethra or bladder, exstrophy of the bladder, spina bifida, and omphalocele[13].

The duplications are classified according to their location (ileum 30%, ileocecal valve 30%, duodenum 10%, stomach 8%, jejunum 8%, colon 7%, rectum 5%), shape: cystic (? 80%) or tubular [14]. Colonic duplications have been classified as follows-

Type I: Duplication limited to the colon or rectum, usually partial	Type II: Colonic duplications; (usually double barrelled) associated with urinary or genital tract duplications
<ul style="list-style-type: none"> <li>• Spherical</li> <li>• Tubular</li> <li>• Double barrelled                             <ol style="list-style-type: none"> <li>1. Limited to colon</li> <li>2. Associated with ileal duplications</li> </ol> </li> <li>• Loop duplications, with separate mesentery and blood supply</li> <li>• Multiple duplications</li> </ul>	<ul style="list-style-type: none"> <li>• Two separate perineal ani                             <ol style="list-style-type: none"> <li>1. Ani nearly always lie on either side midline.</li> <li>2. Associated with double genitals double urethra or bladder.</li> <li>3. Patients are continent, only cosmetic disfigurement is present.</li> </ol> </li> <li>• Fistulas; the distal portion of one or both have connection to another hollow viscus                             <ol style="list-style-type: none"> <li>1. Most have duplication of urogenital system.</li> <li>2. Symptoms related to fistula, or obstruction due to inadequate drainage.</li> <li>3. Surgery successful.</li> </ol> </li> <li>• Imperforate anus; one or both anus imperforate in the pelvis, no fistula                             <ol style="list-style-type: none"> <li>1. All with double lower urinary tract, usually single genital tract.</li> <li>2. Symptoms of obstruction.</li> <li>3. Surgery results poor.</li> </ol> </li> </ul>

J. J. Kottra, W. J. Dodds. Duplication of the large bowel. Journal of radiology 1971; 113:311

Our case can be classified in the second group of type II.

The true etiology of duplication of colon is not known. The idea that the initial developmental abnormality occurs in the gastrulation stage and results in a split notochord has been proposed [15]. However, not all duplications are compatible with this theory, and other theories have been proposed.

Some duplication of the foregut and hindgut may result from "partial twinning". These may be associated with duplications in other paired organs such as the genital and urinary organs. The duplications may occur as a result of persistent embryological diverticula [15]. Duplications may occur by "aberrant luminal recanalization" of the solid stage of the intestine during development [15]. Also, intrauterine trauma and hypoxia may have an effect [11].

The most common symptoms caused by colonic duplications are related to obstructions, pain and constipation, and distension. Type I duplications projecting into the lumen may cause intussusceptions. Double lumen duplications are related to distal anomalies, terminal fistula or imperforate anus [12], preventing adequate emptying. They can become distended with fecal matter and cause obstruction. Pain can result due to over distension and inflammatory changes.

Rarely, bleeding may occur due to ulceration or ischemia caused stretching of mesenteric vessels [9]. Some duplication especially in children may present with a mass. Double-barrelled duplication especially those with adequate drainage, via distal communication or second anus are asymptomatic. Severe aesthetic problems are observed with the duplicated genitalia.

Rectal duplications: Presenting signs of colonic or presacral duplications may include constipation, rectal bleeding, hematochezia, rectal prolapse, hemorrhoids, fistula-in-ano, and perirectal abscess.

The presence of heterotopic mucosa (eg, gastric mucosa) in duplication can lead to peptic ulcerations, bleeding, and perforation with peritonitis [11]. Neoplastic changes have been reported in gastrointestinal duplications [11].

Although preoperative diagnosis has been made with the aid of radiological studies such as a barium enema, the majority of cases have been diagnosed at surgery or upon pathological examination. Barium enema studies are considered essential for the diagnosis of tubular colonic duplication, with opacification of two colons being the diagnostic sign. However, in certain cases, barium enema apparently does not show positive findings. In children

ultrasound is considered the diagnostic imaging modality of choice due to its high accuracy (target-like mass) and for lack of irradiation. In adults a CT-scan is mostly performed [8]. The findings were confirmed at laparotomy.

Most authors recommend that once the diagnosis is made, an elective surgical procedure should be performed to avoid complications and to perform the procedure in an optimal state of the patient, but few think that only symptomatic duplications should be surgically treated. The recommended surgical procedure is excision of the duplication. Resection of both normal and duplicated bowels with intestinal anastomosis is a usual surgical treatment [2]. Sometimes it is possible to resect them without compromising the adjacent bowel vascularization. Although there have been some malignant changes reported in adults [3],

colorectal duplications are in themselves benign lesions. For this reason, surgical excision should not be radical but should involve complete resection of the duplication along with the relevant part of the colon [11].

A long tubular duplication is frequently not entirely resectable. If the blind end is above the pelvic floor, distal internal drainage can be established by excising the common wall for a short distance to allow re-entry into the single distal colon [11]. Internal drainage of tubular colonic duplications is an effective alternative when complete resection is not possible.

Although duplication of the alimentary tract is rare, the possibility of congenital lesions of the alimentary tract should not be overlooked, even in adults presenting with vague or no gastrointestinal symptoms.

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Compiled by:  
Editor

## Open versus laparoscopic cholecystectomy in acute cholecystitis. Systematic review and meta-analysis

International Journal of Surgery, 05/15/2015 Cocolin F, et al.

The aim of the present meta-analysis is to compare open cholecystectomy (OC) and laparoscopic cholecystectomy (LC) in acute cholecystitis (AC). This study suggests that in acute cholecystitis, post-operative morbidity, mortality and hospital stay were reduced by laparoscopic cholecystectomy. Moreover pneumonia and wound infection rate were reduced by LC. Severe hemorrhage and bile leakage rates were not influenced by the technique. Cholecystectomy in acute cholecystitis should be attempted laparoscopically first.

### Methods

- A systematic-review with meta-analysis and meta-regression of trials comparing open vs. laparoscopic cholecystectomy in patients with AC was performed.
- Electronic searches were performed using Medline, Embase, PubMed, Cochrane Central Register of Controlled Trials (CCTR), Cochrane Database of Systematic Reviews (CDSR) and CINAHL.

### Results

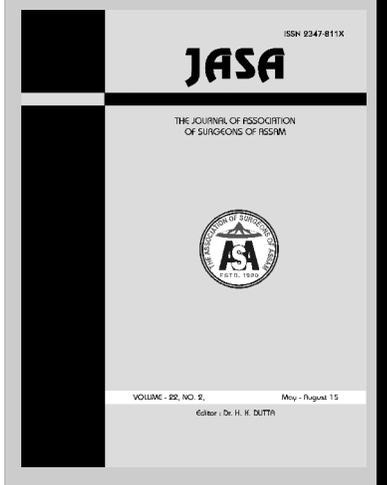
- Ten trials have been included with a total of 1248 patients: 677 in the LC and 697 into the OC groups.
- The post-operative morbidity rate was half with LC (OR = 0.46).
- The post-operative wound infection and pneumonia rates were reduced by LC (OR 0.54 and 0.51 respectively).
- The post-operative mortality rate was reduced by LC (OR = 0.2).
- The mean postoperative hospital stay was significantly shortened in the LC group (MD = ?4.74 days).
- There were no significant differences in the bile leakage rate, intraoperative blood loss and operative times.

## Preoperative prediction of conversion from laparoscopic rectal resection to open surgery: a clinical study of conversion scoring of laparoscopic rectal resection to open surgery

International Journal of Colorectal Disease, 06/24/2015

Zhang GD, et al.

The objectives of this paper were to establish a model for the conversion of laparoscopic rectal resection to open surgery and to predict possible conversion before surgery. Preoperative determination of conversion score may predict possible conversion of laparoscopic rectal resection and thus reduce unnecessary open rectal surgery.



## Methods

- The clinical data of 602 cases of laparoscopic rectal resection were retrospectively assessed.
- Risk factors associated with conversion of laparoscopic rectal resection to open rectal surgery were identified by logistic regression analysis.
- Also, a scoring system was created to calculate a score for the conversion of laparoscopic rectal resection to predict possible conversion for patients who underwent laparoscopic rectal resection before surgery.

## Results

- A total of 90 patients required conversion (total conversion rate = 14.95 %).
- The established model included six variables: male gender, surgical experience ( $\geq 25$  cases), history of abdominal surgery, body mass index  $\geq 28$ , tumor diameter  $\geq 6$  cm, and tumor invasion or metastasis, for which 6, 4, 5, 10, 15, and 21 points were assigned, respectively.
- A patient with a total score  $>14.5$  points was considered to have a high probability of conversion, whereas a patient with a total score  $<14.5$  points was considered at a low risk.

Clinical and Translational Oncology

June 2015

### Surgery combined with chemotherapy for recurrent gastric cancer achieves better long-term prognosis

F. Kong, Y. Qi, H. Liu, F. Gao, P. Yang, Y. Li, Y. Jia

## Abstract

### Backgrounds

Recurrence is the most important factor associated with death of gastric cancer patients after surgery. The aim of this study was to explore the prognosis factors and the effective therapy for recurrent gastric cancer (RGC) patients after radical resection.

### Methods

The clinical data of 144 RGC patients who underwent radical resection from January 1999 to March 2004 were reviewed. The 15 clinicopathological factors and treatment modalities on the survival were analyzed. Univariate and multivariate analyses were performed to investigate the prognostic significance of these factors for RGC.

## Results:

The early recurrence ( $<2$  years) was found in 90 patients, while late recurrence ( $\geq 2$  years) occurred in 54 patients. The 2-year cumulative survival rates were 23.8 % for recurrent patients receiving chemotherapy plus surgery vs. 1.2 % in patients having chemotherapy only ( $p < 0.001$ ), while the median survival time was 11.0 months vs. 6.0 months ( $p < 0.001$ ). Multivariate analysis indicated TNM stage after the first operation ( $p = 0.048$ ), iASPP overexpression ( $p = 0.013$ ), time to recurrence ( $p < 0.001$ ) and treatment of recurrence ( $p < 0.001$ ) as independent prognostic factors.

## Conclusions:

Surgery combined with chemotherapy for recurrent gastric cancer patients achieves ideal long-term prognosis, which should perform actively.

### Laparoscopic single instrument closure of inguinal hernia in female children: A novel technique

Ahmed Abdelgaffar Helal

Pediatric Surgery Department, Al-Azhar University, Cairo, Egypt

Published Online: June 18, 2015

DOI: <http://dx.doi.org/10.1016/j.jpedsurg.2015.05.003>

## Abstract:

### Background

Inguinal hernia repair is the most common operation performed by pediatric surgeons, and herniotomy through a groin incision is the gold standard. Recently minimal access surgery (MAS) has challenged this conventional surgery. At the moment, cosmesis became the target of all MAS especially in female. So, MAS techniques have developed to become more minimally invasive, from 3 to 2 and now single port technique. However, most recent emerging techniques show a tendency for simple extracorporeal suturing with subcutaneous knotting, which has many drawbacks. We introduce a novel technique for laparoscopic repair of inguinal hernia in female children using laparoscopic single instrument closure (LSIC) with intracorporeal knotting.

### Patients and methods:

This prospective study was conducted at Al-Azhar University Hospital, between February 2012 and August 2014. Sixty girls with 68 congenital inguinal hernias were subjected to LSIC. Criteria for enrollment include: female gender, unilateral or bilateral inguinal hernia. Exclusion criteria include: recurrent hernia, hernia in

morbid obese children, complicated hernia, girls who could not tolerate pneumoperitoneum. The main outcome measurements include: operative time, feasibility of the procedure, complications and cosmesis.

**Results :**

A total of 60 girls with 68 congenital inguinal hernias were subjected to LSIC, with a mean age of  $2.2 \pm 2.25$  years (range = 0.58-10.00 years). Complete purse string of internal inguinal ring (IIR) with intracorporeal knotting was done for all cases. All cases were completed laparoscopically without conversion. The mean operative time was  $10.5 \pm 2.2$  minutes for unilateral hernia repair and  $20 \pm 4.3$  for bilateral cases. All patients achieved full recovery without intraoperative or postoperative complications.

**Conclusion :**

LSIC of inguinal hernia in female children is feasible, simple, secure and more cosmetic. It avoids the drawbacks of extracorporeal knotting.

Aesthetic Plastic Surgery

June 2015

## Autologous Fat Grafting in the Breast: Critical Points and Technique Improvements

Hivernaud V, Lefourn B, Guicheux J, Weiss P,

Festy F, Girard AC, Roche R.

**Abstract :**

**Background**

Breast augmentation or reconstruction is a major challenge in esthetic and reconstructive surgery. While

autologous fat grafting (AFG) provides a natural filler and seems easy to harvest, AFG in breast surgery is still problematic especially due to the high resorption rate associated with megavolume transfer. Despite this pending issue, there is growing interest in this method, which is becoming more and more widespread, as can be seen by the recent increase in the number of clinical studies. This review aims to highlight recent knowledge in the technique of AFG to the breast and recent refined procedures to improve fat viability and long-term success of the graft.

**Methods :**

Clinical publications and trials of AFG to the breast from the past 5 years were examined. Attention was focused on the different AFG steps and the clinical outcomes, in order to highlight the strengths and weaknesses of the available protocols.

**Results :**

Recent studies have concentrated on new techniques to improve fat viability and graft intake. However, all of these studies use different protocols at each step of the procedure. Furthermore, results may vary depending on the technique used for fat harvesting and processing.

**Conclusion :**

This review points out the recent advances in breast AFG techniques and their associated outcomes and complications. The bibliography has been carefully examined to reach a consensus so that recommendations could be made for each step of the technique with the aim of improving graft viability and long-term volume maintenance.

# Association News

## HON. SECRETARY'S REPORT from ASSAM STATE CHAPTER of ASI :

Respected esteemed members of Association of Surgeons of Assam (Assam State Chapter of ASI):

It gives me immense pleasure in presenting before you the brief report on recent activities of ASA and its Chapters till date.

The midterm CME 2015 of the Association of Surgeons of Assam was organized at Haji Abdul Majid Memorial (HAMM) Hospital at Hojai, Nagaon on 23rd May'15 with day long scientific programme. A public awareness and training programme on Prevention of Burn and its initial care, in association with Burn Care Foundation, Guwahati has been organized on the previous afternoon. Dr. Kuldeep Singh, Consultant Burn Specialist from Indrapratha Apollo Hospital, New Delhi, Dr. Bhupendra Prasad Sarma, Past President of Assam State Chapter and Convenor, Burn Care Foundation & Dr Nareswar Sarma of same Foundation imparted training as resource persons on essential burn care to 112 participants comprising of doctors, nurses & paramedics. Later a public awareness Program on First Aid and Prevention of burn was held, with 212 persons attending the program. The CME programme was started with a guest lecture on " Advances in Management of Burns " delivered by Dr Kuldeep Singh. As many as seven CME Lectures were delivered by senior members of Association on various topics. In competition paper session eight papers were presented by post graduate students. Dr. Ashish Sriram Kakate from Silchar Medical College got the best paper for his presentation.

Guwahati branch along with Department of Surgery, Gauhati Medical college had organised two seminars. One on "Haemorrhoids" on 20th June and another on " Current management of carcinoma rectum " on 28th June 2015. Dr. H. Bhattacharyee from AIIMS was the guest speaker for the later one. A two days CME on BURNS was also organized by the Department of Plastic Surgery & Burns in Association with APSNEI (Association of Plastic Surgeons of North East India) and ASA (Association of Surgeons of Assam) on 5th and 6th August, 2015, at Gauhati Medical College & Hospital. Eminent faculties and dignitaries attended the seminar. It was well attended by delegates from various disciplines. I would like to offer special thanks to Prof. Dr. Seema Rekha Devi, President, APSNEI & Organizing Chairperson and Dr. Jyotirmay Baishya, Organizing Secretary for their effort to make the event a success.

Dibrugarh branch had organized a CME on 28th June 2015. It was held on a river cruise in Gujjan, Tinisukia. Dr. Sonal Asthana from Global Hospital, Bangalore presented paper on " Trends in Hepatobiliary Surgery and Liver transplantation ". Other speakers were Dr. A.J.Sarma, from IOC Hospital, Digboi about Port Site Hernia, Dr. P. Barua on Emergency Laparoscopic Duodenal Perforation Repair, Dr. T.J.Ghose on Gall Stone Ileus and Dr. M.S.Sarma on Multilocular Thymic Cyst. Session was presided by Dr. R. C. Bhuyan, Dr. A.Borkotoky and Dr. S. Bhuyan.

Undivided Sibsagar District Chapter along with Department of Surgery, Jorhat Medical College had organised a seminar on 9th Aug 2015 at Baniyan Tree Resort, Bhalukmora, Jorhat. Three papers were presented during the session. Dr. Nilotpal Bora presented ' Total Duplication of Colon- a case report ' and Dr. Chandra Bora presented 'How I Do It on Post operative cystic duct stone'. Guest Speaker Dr. K. C. Bhuyan, Guwahati presented a paper

'Antibiotic Resistance - a problem in the present and the future'. Meeting was chaired by Dr. R. N. Mazumder, Chairman, ASA, and Dr. D.C. Barua.

A day long Laparoscopic Surgical workshop is going to be held at Bongaigaon Under the banner of our Bongaigaon branch and AMASI on 29 th, Aug 2015. My best wishes to the organizers.

At last I would like to request all the members to actively participate in our upcoming events ASACON 2015 to be held at Jorhat and ASICON 2015 to be held at Gurgaon.

Thanking you all

Dr. Pulakananda Bharali  
Hon. Secretary.  
Assam State Chapter of ASI

## **INFORMATION FOR AUTHORS :**

### **Manuscript :**

- \* Two complete sets of the manuscripts should be submitted ; typed double spaced throughout.
- \* The manuscript should be arranged as follows : Covering letter, Title page, Abstract, Introduction, Methods, Results Discussion, References, Tables, Legends to figures and Figures.

### **Title page**

- \* Contains the title, names of all the authors and full location of the departments and institutions where the work was performed, name of the corresponding authors.
- \* The name, telephone and fax numbers, and exact postal addresses of the author to whom communication and request for offprints are to be sent should be typed in the lower right corner of the title page
- \* A list of abbreviations used in the paper should be included. In general, the use of abbreviations is discouraged unless they are essential for improving the readability of the text.

### **Abstract :**

- \* The abstract should be unstructured comprising of less than 250 words..

### **Introduction :**

- \* The introduction should state why the study was carried out and what were its specific aims.

### **Methods :**

- \* These should be described in sufficient detail to permit evaluation.
- \* Ethical guidelines followed by the investigators should be described.

### **Results :**

- \* This should be concise and include only the tables and figures necessary to enhance the understanding of the text.

### **Discussion :**

- \* These should consist of review of the literature and relate the major findings of the articles to other publications on the subject. The particular relevance of the results to the health care in Assam should be stressed.

### **Examples of common forms of references are :**

#### **Articles :**

- \* Paintal As. (1955) Impulses in vagal afferent fibres from specific pulmonary deflation receptors. The response of these receptors to phenylguanide, potato S-hydroxytamine and their role in respiratory and cardiovascular reflexes.
- \* Q J expt Physiol 1955; 40-89-111

#### **Books :**

- \* Stansfield A. G. Lymph node biopsy interpretation. New York: Churchill Livingstone, 1985.

#### **Articles in Books :**

- \* Strong MS Recurrent respiratory papillomatosis. In Evans JNG (ed). Scott Brown's Otolaryngology. Volume 6. Paediatric Otolaryngology. London : Butterworth, 1987 : 466-70

#### **Tables :**

- \* These should be typed double spaced on a separate sheet with the table number (in Roman numerals) and above the table and explanatory notes below the table.

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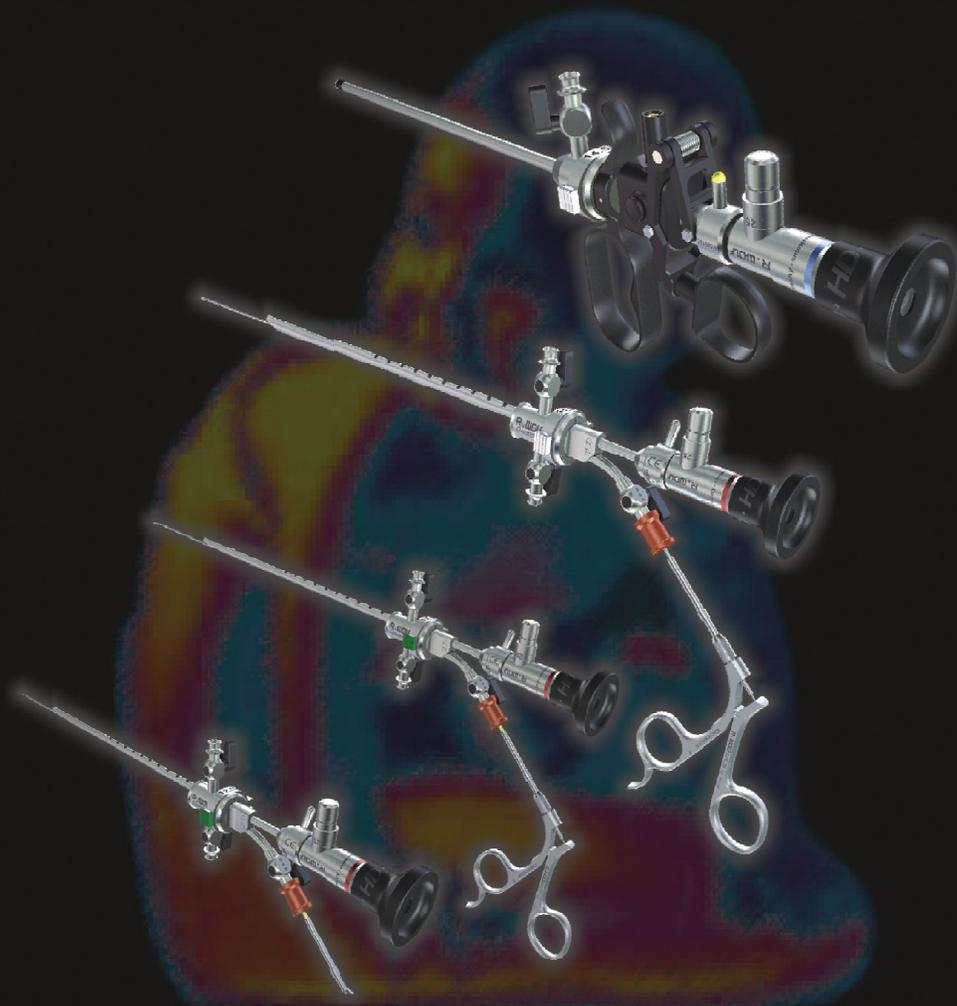
#### **Figure :**

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- \* All photomicrographs should indicate the magnification of the print.
- \* Special features should be indicated by arrows or letters which contrast with the background.
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