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Contents

Editorial	01
Original Articles	
Comparison of Adenosine Deaminase (ADA) level in Different Exudative Causes of Pleural Effusion in a Tertiary Care Hospital of Sirajganj, Bangladesh	03
<i>ASM Fazlul Haque, Md Imrul Kaes, ASM Akramul Islam, Noor Mohammad</i>	
Role of Exercise Tolerance Test (ETT) in the Screening of Ischaemic Heart Disease	09
<i>Md Shamshul Alom, Md Zillur Rahman, Sumaiya Afrin Meem, Umme Habiba Ferdaushi, Md Abdul Hamid Mollah</i>	
Comparative study between the Conservative and Surgical Management of Proximal Humeral Fractures	13
<i>Maniruzzaman Khan, AHM Abdul Wahid, Enamul Haque, Asaduzzaman Azad</i>	
Comparison between Lateral and Posterior Approach of Transversus Abdominis Plane Block after Lower Uterine Segment Cesarean Section	19
<i>Md Miraj Hossain, Md Mezanur Rahman, A B M Shafiul Anam Khan, Md Pervez Rahman, Md Rafiqul Islam, Md Muzibur Rahman</i>	
Case Report	
Bilateral Wilms Tumor in Female Child of Nine Months	27
<i>Md Mofazzal Sharif, Swapna Rani Mondal, AKM Taofiqul Alam, Rezaul Ameen Ferdousy</i>	
Instructions for the Authors	31



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Hybrid Imaging- Abbreviated and Ultrafast MRI

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Magnetic Resonance Imaging (MRI) of Breast is the most sensitive imaging test for breast cancer detection, diagnosis and superior to conventional imaging with mammography, tomosynthesis and ultrasound. Relatively high costs, long examination and prolonged interpretation time hinders breast MRI to become a population-based mass screening tool. Thus, it becomes limited screening tool for women with increased risk of breast cancer.¹ Now a days, abbreviated MRI protocols substantially shorten the image acquisition and its interpretation time. Thereby, it allows higher patient throughput and increased cost effective potential with high diagnostic accuracy. The combination of ultrafast and abbreviated protocols provide required information for an accurate breast lesion/cancer diagnosis.² It is important to realize that the definitions of abbreviated and ultrafast MRI are not mutually exclusive. Basically, it can be considered that ultrafast MRI alone is a form of an abbreviated protocol with a short acquisition time. In most of the published on lesion classification, it is not yet clear whether ultrafast MRI alone is good enough for breast screening.³ But when ultrafast acquisition combines with an abbreviated MRI protocol, that inserts high temporal resolution prior to the acquisition of the first postcontrast sequence. This would allow for the fast evaluation of the entire protocol by evaluating the Maximum Intensity Projection (MIP) image and the high-resolution subtraction series. Ultrafast high temporal resolution

sequences provide additional dynamic information in the presence of lesion. The better information obtained from the novel wash-in characteristics from ultrafast imaging compared to the standard washout evaluation suggests that even with abbreviated ultrafast breast MRI protocols, the necessary kinetic information for an accurate breast cancer diagnosis can be obtained along with valuable morphologic information.³⁻⁵ Although further large-scale studies and standardization of imaging protocols are necessary, it is suggested that abbreviated and ultrafast MRI protocols appear to be feasible as a cost-effective and population based breast MRI screening tool.

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Comparison of Adenosine Deaminase (ADA) level in Different Exudative Causes of Pleural Effusion in a Tertiary Care Hospital of Sirajganj, Bangladesh

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ABSTRACT

Introduction: Pleural effusion is abnormal collection of fluid in the pleural space. Tuberculosis is one of the oldest and commonest infectious diseases which are responsible for pleural effusion. Adenosine deaminase (ADA) has been proposed to be a useful marker for the diagnosis of tubercular pleural effusion. The study had been carried out for comparison of ADA level in different etiology of pleural effusion. **Methods:** This observational study enrolled a total 161 cases of pleural effusion. We divided cases into three groups: group 1(tuberculosis): 87 cases, Group 2 (malignancy):31 cases and Group3 (non-tuberculous and non-malignant): 43 cases. ADA estimation was done by spectrophotometer. **Results:** Tuberculosis was the primary etiology of 87 cases (54.04%) whereas malignancy was the next most prevalent cause accounting to 31 cases (19.25%). These two were followed by other non-tubercular and nonmalignant 43 cases (26.71%). Mean ADA level was highest in TB (68.67 IU/L) in comparison with malignancy and other causes. **Conclusion:** It can be concluded that, most common cause of pleural effusion was tuberculosis, followed by malignancy and ADA level was highest in TB than any other causes.

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INTRODUCTION

Accumulation of excess fluid between the two pleural layers is called pleural effusion.¹ Tuberculosis (TB) is the leading cause of pleural effusion in some countries and a global burning problem, which is now the world's seventh leading cause of death.^{2,3}

Pleural effusion is a common problem clinical problem which can result from a number of diseases. The available test and procedures for the confirmation of its etiology are ineffective in majority of cases. Thus, there is need for a sensitive and specific test that is reliable and rapid.⁴ The sensitivity of acid-fast staining and

culture for *M. Tuberculosis* in pleural fluid is inadequate.⁵ Elevated levels of adenosine deaminase (ADA) in the pleural fluid exhibit sensitivity and specificity values exceeding 90% for diagnosis of pleural tuberculosis.^{6,7} Analysis of pleural fluid can have an important contribution for diagnosis of patients with pleural effusion.⁸ Cytological examination not only helps for diagnosing tuberculous pleural effusion but also for staging and prognosis of malignant causes of pleural effusion.⁹ Levels of ADA are particularly useful in areas where the prevalence of tuberculosis is high.¹⁰ This study was carried out to compare the ADA level in various exudative causes of pleural effusion.

METHODS

This observational study was carried out in the Department of Pathology of Khawaja Yunus Ali Medical College Hospital (KYAMCH), Enayetpur, Sirajganj, Bangladesh over a period of eight months from 10th September, 2020 to 10th May, 2021. According to selection criteria a total of 161 patients presenting with pleural effusion were included in this study after taking informed written consent and ethical clearance. Study cases were divided into three groups: Group 1: Tuberculosis, Group 2: Malignancy and Group 3: Others (Non tubercular and non-malignant). Inclusion criteria were: 1. Patient over 10 years of age from both sexes and 2. Patients with exudative causes of pleural effusion. Exclusion criteria were: 1. Patients with hem thorax and

chylothorax, 2. Hemodynamically unstable patient, 3. Patients whom ADA level was not measured and 4. Patients of pleural effusion with transudative cause. Detailed history was taken from all study subjects. Relevant investigations such as haemoglobin concentration, total and differential leucocyte count (TDLC), erythrocyte sedimentation rate (ESR), random blood sugar, serum proteins, urine and sputum examination, tuberculin test and plain X-ray chest P/A view were done. Physical and cytological examinations were carried out. ADA level, glucose and protein estimation of pleural fluid were also done by spectrophotometric method using AU-400-Olympus instrument. Clinicocytological and ADA correlation was done in all the cases for the diagnosis of tubercular pleural effusion. Pleural fluid was collected in two separate containers; one for biochemical analysis: protein, glucose and ADA estimation, and another for TDLC and cytological examination. About 20ml fluid was collected for this study. The pleural fluid was examined for above-mentioned tests within 3 to 4 hours of collection. Gram's stain, Ziehl-Neelsen (ZN) stain, culture and sensitivity was done. Frequency and percentage calculation was done by scientific calculator.

RESULTS

A total of 161 cases of diagnosed pleural effusion were taken in this study maintaining the selection criteria. All the cases were exudative type of pleural effusion.

Table I: Age and sex distribution of patients

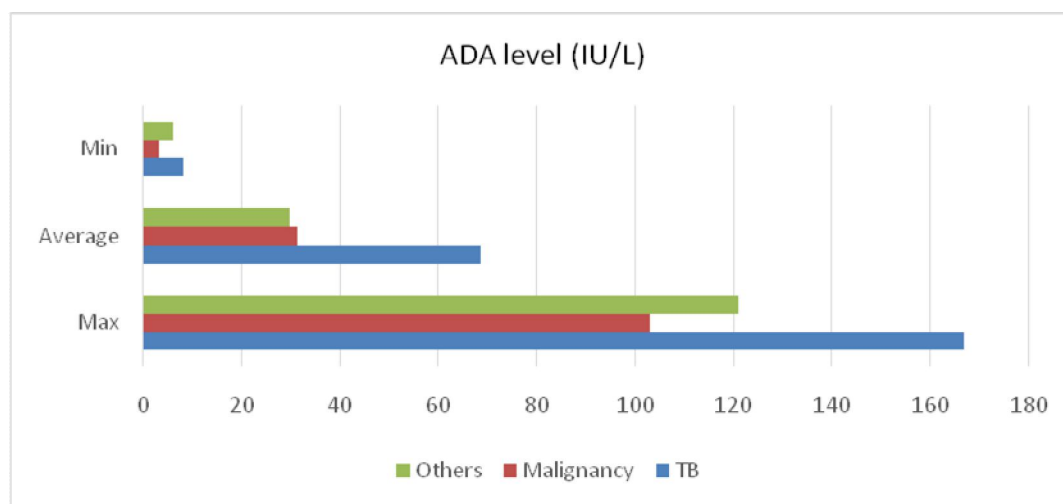
Age group in years	Male	Female	Total (%)
11-20	2	6	8(4.97)
21-30	11	16	27 (16.77)
31-40	10	16	26 (16.15)
41-50	24	6	30 (18.63)
51-60	24	7	31 (19.25)
>60	30	9	39 (24.20)
Total	101 (62.73%)	60 (37.27%)	161 (100%)

Out of 161 patients majority were male (101, 62.73%) and maximum patients belonged to >60 years (Table I).

Table II: Distribution of exudative pleural effusion according to causes

Causes of pleural effusion	Frequency	Percentage (%)
TB	87	54.04
Malignancy	31	19.25
Others	43	26.71
Total	161	100

Tuberculosis was the primary etiology of the total 87 cases (54.04%) whereas malignancy was the next most prevalent cause of exudative pleural effusion accounting for 31 cases (19.25%). Other causes were 43(26.71%) (Table II).

**Figure 1: Comparison of ADA (IU/L) level among TB, malignancy and others****Table III: ADA level in different groups of patient**

Name of diseases	Level of ADA (Mean \pm SD)IU/L	Range (IU/L)
TB	68.67 \pm 38.17	8-167
Malignancy	31.29 \pm 21.69	3-103
Others(Non-malignant and non-TB.)	29.79 \pm 26.13	6-121

ADA level in TB (68.67 \pm 38.17 IU/L) was higher than malignancy (31.29 \pm 21.69 IU/L). (Figure 1 and Table III).

Table IV: Cut value of ADA in different diseases

Name of diseases	ADA>40IU/L	ADA \leq 40IU/L	Total
TB	57	30	87
Malignant	4	27	31
Others	9	34	43

Cut value of ADA for TB is 40 IU/L above 40 ADA level was in 57 cases for TB and \leq 40IU/L in 30 cases. In case of malignancy >40 IU/L only in 4 cases and \leq 40IU/L in 27 cases, similarly other causes (non malignant and non-tuberculous) ADA

level>40 only in 9 cases but \leq 40IU/L was in 34 cases. Therefore, In case of non-TB (malignant and others), ADA >40 in only 13 (4+9) cases and ADA \leq 40 in 61 (27+34) cases (Table IV).

Table V: Comparison of sensitivity and specificity between tubercular and non-tubercular pleural effusion

Diagnostic test (ADA >40 IU/L)	Tubercular effusion	Non-tubercular effusion	Total
Positive	57 (TP)	13 (FP)	70
Negative	30 (FN)	61(TN)	91
Total	87 (TP+ FN)	74 (FP+TN)	161

Considering ADA=40IU/L as cut value for tuberculosis, we found 57 cases as true positive (TP) and 13 case as false positive (FP). On the other hand, 30 cases are false negative (FN) and 61 cases are true negative (TN) Table (V).

Sensitivity = TP/ (TP+FN) = 57/ 87 = 65.51%

Specificity = TN/ (FP+TN) = 61/ 74 = 82.43 %

Positive predictive value (PPV) = TP/ (TP+FP) = 57/ 70 = 81.43%

Negative predictive value (NPV) = TN/ (FN+TN) = 61/91=67.03%

Positive likelihood ratio = Sensitivity/ (100-specificity) = 65.51/ (100- 82.43) = 3.72

Negative likelihood ratio = (100- sensitivity)/ specificity = (100 - 65.51)/ 82.43 = 0.418

As PPV is 81.43%, it means that test positive individual(s) (ADA>40 IU/L) there is 81.43% chance for tuberculosis and NPV is 67.03%, it means when ADA ≤40 IU/L there is no chance of tuberculosis in 67.03% of cases. As well as here

positive likelihood ratio is more than one (1) indicating that the test (high ADA) has diagnostic value; tubercular patients are 3.72 times more likely to have high ADA. Similarly, as negative likelihood ratio is less than one (1) its indicating patient with tubercular effusion less likely to have negative test (low ADA); but test is not too unfailling to exclude the disease as negative likelihood ratio is not ≤0.1.

DISCUSSION

In this study, out of 161 patients maximum belonged >60 (39, 24.2%) years of age and majority were male (101, 62.73%). Most common cause of exudative pleural effusion was tuberculosis (54.04%), followed by malignancy (19.25%). This result supports the findings of Valdes et al.¹¹

Table VI: Comparison of causes of pleural effusion with other studies

Type of pleural effusion	This study (%)	Dambal et al. ¹² (%)	Bhabshar et al. ¹³ (%)	Vinay et al. ¹⁴ (%)	Khan et al. ¹⁵ (%)
Tuberculous pleural effusion	54.04	65.5	66	58	33
Malignant pleural effusion	19.25	18.2	18	17	16
Others (non tuberculous and non-malignant effusion)	26.71	16.3	16	25	51
Total	100	100	100	100	100

In this study, incidence of tuberculous pleural effusion was 54.04% which is consistent with the studies of Dambal et al.¹², Bhabshar et al.¹³ and Vinay et al.¹⁴ but Khan et al.¹⁵ observed other causes are more common for pleural effusion (Table VI).

Table VII: Comparison of mean ADA level in various group of pleural effusion

Type of effusion	Mean ADA level (IU/L)		
	This study	Vinay et al. ¹⁴	Lamsal et al. ¹⁶
Tuberculous Pleural effusion	68.67	67.78	34.53
Malignant pleural effusion	31.29	22.90	18.20
Non-tubercular and non malignant effusion	29.79	22.17	16.71

In this study mean ADA value of tubercular pleural effusion was higher as compared with non-tubercular and malignant pleural effusion, which was consistent with the study findings of Vinay et al.¹⁴ and Lamsal et al.¹⁶

Tuberculosis was also the leading cause of pleural effusion in another study conducted by Maikap et al.¹⁷ Similar study conducted in a respiratory intensive care set up by Chinchkar et al.¹⁸ found malignancy to be the most frequent cause of pleural effusion.

Majority of the cases of pleural effusion were males as compared to females in this study (62.73% vs 37.27%) having male: female ratio 1.68:1. Maikap et al.¹⁷ and Sharma et al.¹⁹ also found similar male majority in their studies.

Current study revealed, the patients with pleural effusion were found in all age groups ranging from 11 to 84 years. Patients aged more than 60 years represent the largest group (24.22%). In between 31 and 40 age group (29.34%) was the largest group in the study of Parikh et al.²⁰

Many authors^{15,21} reported that values of ADA were significantly higher in tubercular pleural effusions. Similar result was observed in this study. Malignant pleural effusion was found in 19.25% of cases which was quite similar to different researches done previously by Khan et al.¹⁵ (15.55%), Maikap et al.¹⁷ (14%) and Chinchkar et al.¹⁸ (24%). This study limitations were small sample size and short duration of study period.

CONCLUSION

It can be concluded that, most common cause of pleural effusion in a tertiary hospital was tuberculosis, followed by malignancy. In biochemical study, ADA level is the highest in tuberculosis than any other causes of pleural effusion.

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Role of Exercise Tolerance Test (ETT) in the Screening of Ischaemic Heart Disease

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ABSTRACT

Introduction: Ischemic Heart Disease (IHD) is a common health problem now a day. It is preventable and reversible if early screening and elimination of the risk factors can be done. Exercise Tolerance Test (ETT) has become an important diagnostic tool to evaluate patient with suspected or known case of IHD. This study was aimed to determine the role of ETT as a screening test for IHD.

Methods: This observational study was conducted in cardiology department of North Bengal Medical College Hospital, Sirajganj, Bangladesh over a period of one year, from 1st January 2021 to 31st December 2021. Total numbers of 200 patients were enrolled for this study and relevant data was collected from the study subjects using standard Bruce protocol. The standard Bruce protocol was used to evaluation of ischemia and angina. **Results:** Out of 200 patients, majority (124, 62%) were male. Chest pain (170, 85%) was the commonest indication of ETT and obesity (78, 39%) was the commonest risk factor of IHD. Baseline ECG was mostly nonspecific T-change with sinus rhythm and study of ECG changes during exercise reveal, no ST-changes in 96 (48%) and acute ST-changes seen in 40 (20%). Majority of the subjects 116 (58%) were test negative whereas 42 (21%) were test positive and 62 (31%) were test equivocal. **Conclusion:** It is concluded that most of the subjects presenting with the suspected symptoms of myocardial ischemia were negative for IHD, and so why we advocate the use of ETT as a screening tool in patients who presents with features simulating angina. This will prevent unnecessary hospital admission.

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INTRODUCTION

Coronary artery disease (CAD) is a global health problem in both developed and developing countries and is the leading

cause of mortality and morbidity world-wide.^{1,2}

The South Asian countries have the highest incidence of coronary artery disease.³ The prevalence of Ischemic Heart Disease (IHD) is

6.8% in Pakistan and United States of America.⁴ In the last three decades, the prevalence of CAD has increased from 1.1% to about 7.5% in urban population of Delhi, India and from 2.1% to 3.7% in rural population.⁵ Data related to different aspect of CAD in Bangladesh are inadequate but it is highly prevalent in Bangladesh.⁶ The IHD is preventable and reversible if early screening and elimination of risk factors like life style modification and dietary intervention can be done.⁷ Exercise Tolerance Test (ETT) has become an important diagnostic tool to evaluate patient with suspected or known cases of heart disease.⁸ It is one of the least costly of all non-invasive investigation for the screening of IHD.⁹ However, because of low sensitivity and specificity, it just provides a basis for further planning and clinical decision making regarding coronary angiography. So, the objective of this study was to evaluate the role of ETT in the screening of IHD.

METHODS

This observational study was carried out in the Department of Cardiology, North Bengal Medical College Hospital, Sirajganj, Bangladesh. Total 200 subjects were enrolled for the study from 1st January, 2021 to 31st December, 2021. During this period patients with the symptoms of stable angina came to out patients department (OPD) of cardiology, north Bengal medical college were included. The standard Bruce protocol was used for evaluation of ischemia and angina. The result was considered positive if horizontal or descending ST-segment depression was ≥ 1 mm or ST-segment elevation or inotropic failure appeared i.e. fall of systolic arterial blood pressure >10 mmHg. Similarly, test was considered negative if the sub-maximum heart rate (85% of the maximum expected rate for age) was achieved without angina or definite ischemic changes. The test result was considered equivocal when there was only minimum T-

inversion without ST changes and no definite angina. Frequency and percentage were calculated manually.

RESULTS

Among total 200 patients, there were 124 (62%) males and 76 (38%) were females with age range from 28 to 85 years (mean- 46.84 ± 10.56). Chest pain was the commonest indications (Table I) of ETT and obesity was the commonest risk factor (Table II) of IHD. Baseline ECG was mostly nonspecific T-change with sinus rhythm and study of ECG changes during exercise reveal, no ST-changes in 96 (48%) and acute ST-changes seen in 40 (20%) (Table III). Result of the ETT among 200 patients were summarized as following, ETT negative 116 (58%), ETT positive 62 (31%), ETT equivocal 22 (11%) (Figure1). All the ETT positive cases 62 (31%) underwent for coronary angiography. Among them 46 (23%) had significant coronary artery disease involving left main stem or left anterior descending artery.

Table I: Indications of ETT

Indications	Number	Percentage
Evaluation of chest pain	170	85%
Post-PCI evaluation	08	04%
Post-CABG evaluation	04	02%
General check-up	18	09%
Total	200	100%

Table II: Risk factors for IHD

Risk factors	Number	Percentages
Obesity	78	39%
Hypertension	72	36%
Smoking	70	35%
Dyslipidemia	60	30%
Diabetes	56	28%
Family history	42	21%

Table-III: ECG changes during exercise

Variables	Frequency	Percentage
No ST changes	96	48%
Acute changes	40	20%
ST changes (Significant/borderline):		

In lead II,III,aVf and V4-V6	32	16%
In lead I,aVI and V4-V6	12	06%
In lead V4-V6	06	03%
In lead I, aVI, V1-V6	04	02%
In lead I,aVI,II,III,aVf and V4-V6	10	05%
Total	200	100%

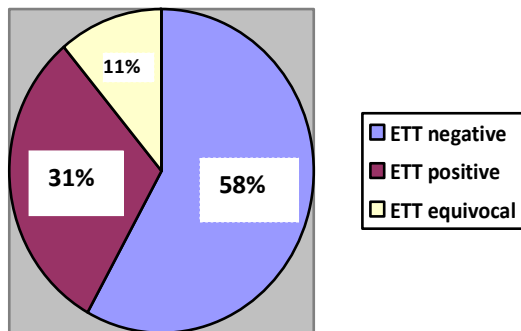


Figure 1: Interpretations of ETT

DISCUSSION

Stress testing has been used since late 1920s as a convenient, non-invasive way to assess for exercise induced myocardial ischemia.¹⁰ Stress testing with exercise or imaging has the greatest value in patient with a pretest intermediate risk for Coronary artery disease (CAD). It can be performed with several modalities that can provide different type of information regarding diagnosis and prognosis. Several studies may be considered, including coronary calcium calcification (CAC) scoring, coronary computed tomography angiogram (CCTA), stress testing with and without an imaging modality and catheterization (not usually the initial screening test). An Exercise Tolerance Test (ETT) can be used to assess tolerance of increased activity with continuous ECG monitoring, as well as hemodynamic response and symptoms. This test is well established, inexpensive, and easily available. In addition to providing information regarding exercise-induced ischemia, ETT also offer information regarding exercise capacity and functional status. The stress portion of the test can be conducted with exercise or medical therapy. Exercise testing has a sensitivity of 78% and specificity of 70% for coronary artery disease

detection. So, it cannot be used to rule in and rule out IHD unless the probability of CAD is taken into account. In a low risk population, like men <30 years and women <40 years, a positive test result may be false positive. In a high risk population, like those aged over 50 years with typical angina symptoms, a negative result cannot rule out IHD.¹¹ Exercise induced chest discomfort without associated ECG changes may be the only signal that obstructive coronary artery disease is present.¹² It was noticed that changes in ECG like ST-segment depression or T wave inversion also affect the test result. A completely normal ETT has been reported to be a good prognostic indicator in diabetic patients.¹³ The leading cause of mortality in patients with diabetes is cardiovascular disease (CVD), when it does occur, CVD in diabetic patients is more severe, more complex, and results in higher complication rate than in patients without diabetes. In this study, diabetes was present in 56 (28%) patients. The ETT is very cost effective in compared with CCTA, echocardiography and stress single photon emission computed tomography (SPECT) myocardial perfusion imaging. An ETT can be safe and effective initial screening test in patients who can exercise and have a normal baseline ECG. The ETT is preferable to a pharmacological stress test. Also patients have the advantage not to get exposed to ionizing radiation and contrast media. The more recently developed non-invasive, multi-slice CT-angiography is still recommended to rule out CAD, but has the associated risk of high radiation exposure and is not cost effective.¹⁴ An estimated 1 in 270 women who underwent CT coronary angiography at age 40 years will develop cancer from radiation exposure during that CT, compared with an estimated 1 in 8100 women who had a routine head CT scan at the

same age.¹⁵ For these reasons, ETT can be used as a screening test for early diagnosis of IHD.

Limitation: This was a single centre study.

CONCLUSION

Most of the subjects presenting with symptoms simulating myocardial ischemia were ETT negative for ischemic heart disease. So this study suggests that, for the prevention of unnecessary hospital admission, ETT should be done on patients presenting with signs and symptoms simulating IHD.

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Comparative study between the Conservative and Surgical Management of Proximal Humeral Fractures

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ABSTRACT

Introduction: Proximal humeral fractures were treated conservatively in the past and often had compromised functional results. With the advancement of surgical techniques, these fractures, especially displaced one, are now more often managed operatively to meet the needs of the patient, and provide early rehabilitation and better functional outcome. This study was aimed to compare the outcome of surgically and conservatively managed proximal humeral fractures.

Methods: This observational study was conducted in the Department of Orthopedics and traumatology of North Bengal Medical College and Hospital, Sirajganj, Bangladesh, from January, 2019 to December, 2022. A total of 36 patients with proximal humeral fractures were enrolled for this study. Twenty (n-20) patients were treated surgically and sixteen (n-16) were managed conservatively. Management outcome was observed by Swanson Shoulder Scoring System. **Results:** Maximum patients were male and majority of them belonged to >50 years of age. Left sided proximal humeral fractures were common and frequent causes were road traffic accident. In surgical management, 10 (50%) patients had a good outcome but 6 (30%) patients had an excellent outcome. However, in case of conservative management, the majority of the patients had good outcome 7 (43.75%). **Conclusion:** Finally better outcome was observed in the surgically managed patients having proximal humeral fractures. This success of the result depends on early surgery, good preoperative planning, minimal soft tissue intervention, stable reduction, supervised postoperative exercise and regular follow-up.

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INTRODUCTION

Proximal humeral fractures are the second most common upper-extremity fracture and the third most common among the all fractures which account for about 5% of all injuries to the appendicular skeleton.¹ In young individuals, high-velocity trauma is the cause of these fractures, whereas a simple fall can be the

cause in older individuals because of osteoporosis. Most of these fractures are stable, non-displaced, or minimally displaced and can be treated non-operatively.² Approximately 20% of displaced proximal humeral fractures may benefit from operative treatment.³ Many surgical management techniques have been described, but no single approach is considered the standard of

care.⁴ Many techniques have developed to treat displaced or comminuted proximal humerus fractures. Percutaneous pinning and intramedullary nailing have been employed with generally satisfactory results and carry a low risk for infection, soft tissue disruption, and blood loss.⁵ However, many of these constructions are less stable than open reduction and internal fixation (ORIF) with locking plates.^{5,6} ORIF with locking plating are promising options in treating displaced, comminuted proximal humerus fractures. This approach offers several advantages compared to traditional open techniques.⁷ These benefits include improved fracture stability because of the fixed-angle construct, particularly in more comminuted fracture patterns and osteoporotic bone, and a short period of immobilization with the opportunity for earlier rehabilitation.⁸ The aim of this study was to compare the results of surgically and conservatively managed proximal humeral fractures.

METHODS

This observational study was conducted in the Department of Orthopedics and traumatology of North Bengal Medical College and Hospital, Sirajganj, Bangladesh, from January, 2019 to

December, 2022. A total of 36 patients with proximal humeral fractures were enrolled for this study. Twenty patients were treated surgically and sixteen were managed conservatively. Inclusion criteria were 1. Patients of all ages, 2. Patients with an injury duration <2 weeks and 3. Patients with Neer's two-part, three-part and four-part fractures and fracture-dislocation. Exclusion criteria were 1. Patients with any medical or surgical illness that may interfere with surgical procedures and anaesthesia, 2. Patients with previous fractures of the involved shoulder or any other shoulder pathology and a history of previous neuromuscular weakness.

Neer's trauma series X-rays were done to study the type of injury, which include (a) AP view and (b) Axillary view of shoulder joint. The indication for surgery was severely displaced two-part fractures not reducible by conservative method, displaced three-part fractures with the rotational displacement of an articular fragment, displaced four-part fractures with mal-alignment, and fractures dislocation. Synthes proximal humerus locking plate was used for all patients Figure 1 (A-D).

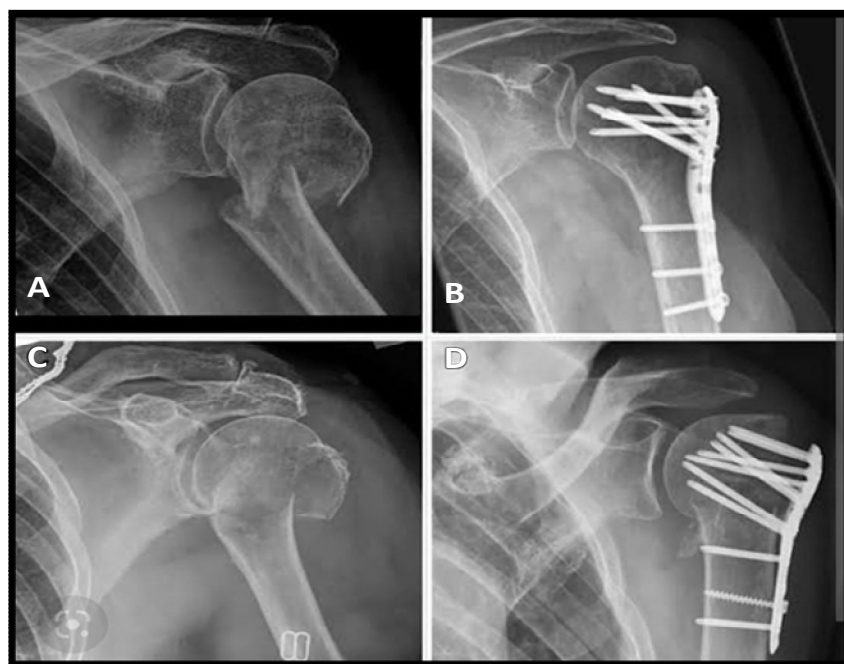


Figure 1: Preoperative and post-operative X-ray images with Synthes proximal humerus locking plate

For conservative management, the most important criteria was examining the proximal part of the humerus, which could be moved with most of the motion occurring at the glenohumeral joint and not at the fracture site. All fractures were considered stable if the shoulder motions are tolerated by the patients during its range of movement. The involved extremity was immobilized in an arm-to-chest bandage or shoulder immobilizer to relieve pain. At the three weeks, active and assisted physiotherapy of the shoulder was started under the supervision and guidance of a physiotherapist in the outpatient department (OPD), in the form of circumduction, wall clumping, rope pulling, back wiping, external rotation, and pendulum exercises. These exercises for the shoulder were started with the patient in the supine position for forward elevation, external rotation, and internal rotation. All patients were advised to follow up in 4 weeks, 6 weeks, 12 weeks, and 18 weeks. Patients were evaluated for functional outcome by using the Swanson Shoulder Scoring System. Result of the management has been expressed as per Swanson Shoulder Scoring system (Table I). Functional outcome was graded into Excellent, Good, Fair and Poor on the basis of three constant scores regarding range of motion (Table II), pain score (Table III), activity of daily living (Table IV) of the patients.

Table I: Swanson Shoulder Score (3x10=30 points)

Outcome	Shoulder Score Points
Poor	<18
Fair	18-22.9
Good	23-27.9
Excellent	28-30.0

Table II: Range of Motion (ROM)

	ROM Score (10 points)	
	Points	ROM
Abduction (2 points)	0.4	<20°
	0.8	21°-40°
	1.2	41°-60°
	1.6	61°-80°
	2	>80°
Adduction (1 point)	0.2	<10°

	0.4	11°-20°
	0.6	21°-30°
	0.8	31°-40°
	1	>40°
The extension (1 point)	0.2	0°
	0.4	1°-10°
	0.6	11°-20°
	0.8	21°-30°
	1	>30°
Flexion (4 points)	0.8	<20°
	1.6	21°-40°
	2.4	41°-60°
	3.2	61°-80°
	4	>80°
Internal rotation (1 point)	0.2	<20°
	0.4	21°-40°
	0.6	41°-60°
	0.8	61°-80°
	1	>80°
External rotation (1 point)	0.2	0°
	0.4	1°-10°
	0.6	11°-20°
	0.8	21°-30°
	1	>30°

Table III: Pain score (PS)

Pain Score (10 points)	
Degree	Points
Pain-free	<10
Minimal pain after heavy work	8
Pain with daily activity	6
Pain with shoulder motion	4
Pain at rest	2

Table IV: Activities of daily living (ADL)

ADL Score (10 points)	
Activity	Points
Independent, normal activities	10
Slight restrictions for heavy work overhead	8
Most ADL	6
Light activities only, assistance for some ADL	4
Inability to use the shoulder for function	2

All data were presented in a suitable table and chart according to their affinity. Informed written consent was taken from the study subjects. All calculations were performed manually.

RESULTS

In this study, most of the patients (16, 44.44%) were belonged to more than 50 years age group (Table V). Among the total patients, maximum (22, 61.11%) were male (Figure 2).

Table V: Age distribution of the study population (n-36)

Age range (Year)	Frequency	Percentage
<40	13	36.11%
40-50	7	19.44%
>50	16	44.44%
Total	36	100 %

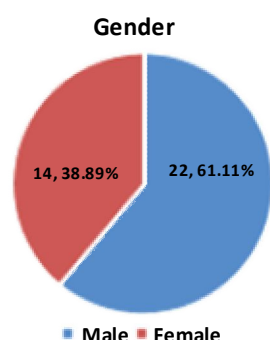


Figure 2: Gender distribution of the patients (n-36)

In the affected patients major cause of fracture was road traffic accident (21, 58.33%), and left

sided fracture was common (22, 61.11%) (Table VI).

Table VI: Mode of injury and fracture side

Variables	Frequency	Percentage
Mode of injury		
Road traffic accident	21	58.33%
Fall from height	7	19.44%
Simple fall on the shoulder	3	8.33%
Fall on an outstretched hand (indirect injury)	3	8.33%
Sports Injury	2	5.56%
Side affected		
Right	14	38.89%
Left	22	61.11%

Outcome of the management has been expressed as per Swanson Shoulder Scoring system. Functional outcome was graded into Excellent, Good, Fair and Poor on the basis of three constant scores regarding range of motion, pain, activity of daily living of the patients.

Among the total surgically managed patients, 10 (50.00%) had a good outcome, 6 (30.00%) had an excellent outcome, 3 (15.00%) had a fair outcome but only 1 (5%) patient had a poor result. However, in conservative management, the majority patients (7, 43.75%) had good outcome, 6 (37.50%) patients had fair outcome and only 1 patient (6.25%) had poor outcome (Table VII).

Table VII: Functional outcome of the study

Outcome	Surgically managed (n-20)		Conservatively managed (n-16)	
	Frequency	Percentage	Frequency	Percentage
Excellent	6	30.00%	2	12.50%
Good	10	50.00%	7	43.75%
Fair	3	15.00%	6	37.50%
Poor	1	5.00%	1	6.25%

DISCUSSION

Proximal humeral fractures constitute 4-5% of all fractures of long bones. It represents 2-3% of the fractures of the upper limb. The incidence of

these fractures is 73 per one lakh population, among them, 75% fractures are seen in the elderly, of which 80-85% are amenable to conservative treatment and remaining 15-20%

are significantly displaced and require some internal fixation.^{9,10} Researcher¹¹ stated that the predominance of proximal humeral fractures in females in an elderly age group. However, Jain et al.¹² revealed that male to female ratio was 1:0.8. On the other hand, in our study, the male-to-female ratio was 1.6:1 (22:14) which is a bimodal presentation among the adolescents and younger middle age patients those are more prone to high-velocity injuries. But these fractures are seen in elderly patients (>50 years) due to osteoporosis.

In this study, leading fracture side was left and left and right ratio was 1.57:1, which is supported by Anand et al.¹³ There was no bilateral involvement in any patient.

The mode of injury commonly observed in this study was road traffic accidents (21, 58.33%) followed by fall from height (7, 19.45%). These observations were found to be consistent with the findings of Herscovici et al.¹⁰ However, fast pace modern life and accelerated travel increase the number of fractures.

In this study, surgically managed 10 (50%) patients had a good outcome, 6 (30%) patients had an excellent outcome, 3 (15%) patients had fair outcome and only 1(5%) patient had a poor result. Anand et al.¹³ observed both of excellent and good outcomes (30.8%) in surgically managed patients, 38.4% patients had fair outcome and none of the patient showed poor outcome. This study revealed better surgical outcome than Anand et al.¹³ due to early surgery, minimal soft tissue interference and good patient's compliance. In the present study, in conservative management, the majority of the patients had good (7, 43.75%), fair 6 (37.50%), excellent 2 (12.5%) and only 1 (6.25) patient had poor outcome. On the other hand, Anand et al.¹³ demonstrated that there was no excellent outcome but 30.8% had poor outcome. They also observed good and fair outcomes in 15.4% and 53.8% cases respectively. Good patient's compliance and early start of passive exercise are major contributory factors for better conservative outcome in this study. These

findings are consistent with the observations of other studies.¹⁴⁻¹⁶

CONCLUSION

This study concluded that, the surgically managed fractures have better outcome than conservative management for early and healthy recovery.

Limitations: This study may not represent the real scenario of whole country because of a smaller number of study subjects, limited area of observation and short period of study.

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Comparison between Lateral and Posterior Approach of Transversus Abdominis Plane Block after Lower Uterine Segment Cesarean Section

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ABSTRACT

Introduction: Ultrasound guided Transversus Abdominis Plane (TAP) block is a new anesthetic technique which is used for post-operative pain management in abdominal surgery. Ultrasound-guided lateral and posterior approaches of TAP block is useful in the management of post-operative pain after lower uterine cesarean section (LUCS) operation. Aim of this study is to compare the usefulness of lateral and posterior approaches of ultrasound-guided TAP block after LUCS in post-operative pain management, presence of complications and patient satisfaction level. **Methods:** This randomized clinical trial was carried out in Khwaja Yunus Ali Medical College and Hospital during the period of July, 2020 to June, 2021. A total of 90 patients were scheduled for elective LUCS and assigned into two equal groups, group A and group B received ultrasound guided TAP block in lateral and in posterior approach respectively. Then patients were observed for pain intensity from side to side movement by visual analogue scale (VAS), postoperative complications after 1 hour, 2 hours, 4 hours, 6 hours, 12 hours and 24 hours of TAP block, patient's overall satisfaction regarding postoperative analgesia. Statistical analyses of the results were obtained by using window based computer software devised with Statistical Packages for Social Sciences (SPSS-22). **Results:** The mean pain intensity in visual analogue scale (VAS) was statistically significant ($p < 0.05$) at 4, 6, 12 and 24 hours after TAP block between lateral and posterior approach. Post-operative complications like sedation, nausea and vomiting were less in patients receiving TAP in posterior approach than lateral approach. Most of the patients were satisfied (24, 53.3%) regarding post-operative analgesia in TAP with posterior approach. **Conclusion:** TAP block in posterior approach provided considerably good post-operative analgesia, patient satisfaction and less complication in post-operative first 24 hours than lateral approach after LUCS.

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INTRODUCTION

Lower uterine cesarean section (LUCS) with pfannenstiel incision in the lower abdomen causes severe pain, especially in the first two days after operation.¹ Poor pain control after LUCS can be associated with postoperative hemodynamic changes and other complications.^{2,3} Ultimately that causes prolonged hospital stay and it also has an impact on psychological changes, quality of life, and patient satisfaction.⁴ Moreover, good postoperative analgesia can prevent the development of chronic pain after LUCS.⁴ There are several methods available to treat postoperative pain such as opioids injections, and regional analgesia like epidural analgesia and peripheral blocks. Among them, opioids are popular after LUCS. But opioids have many side effects like sedation, nausea and vomiting, itching etc.^{5,6} Transversus Abdominis Plane (TAP) block is a peripheral nerve block technique that blocks the anterior division of T₆ to the L₁ spinal nerve, supplying the anterolateral abdominal wall, which carries pain sensation after abdominal incisions.⁷ These nerves runs into the fascial plane between the internal oblique and transversus abdominis muscles.⁸ TAP block can provide postoperative analgesia after lower abdominal surgery. In this technique, local anesthetic is administered into the neurovascular plane between the internal oblique and transversus abdominis muscles by ultrasound guidance. Out of several techniques, lateral TAP and posterior TAP block are popular. When local anesthetic injection is administered along mid axillary line is called lateral TAP block and if in lumbar triangle of petit called posterior TAP block.⁴ Since the first description of the TAP block in 2007,⁴ many studies have reported that TAP block is a useful strategy to manage postoperative pain for patients undergoing lower abdominal surgery.^{9,10} It can reduce postoperative pain and other complications after LUCS.⁴ It also can effectively use as a part of multimodal analgesia in patients undergoing total abdominal hysterectomy. Earlier, TAP block is performed prior to surgical incision, and they found that the TAP block with ropivacaine reduced postoperative Visual Analogue Scale

(VAS) scores at 6, 36, and 48 hours and total morphine requirements in the first 48 postoperative hours were also reduced and it delivers a superior analgesic effect with less postoperative complications with good quality of recovery.⁷

After the LUCS, a well-planned analgesia is needed for early mobilization, shorten post-anesthetic care, hospital stay, and to ensure adequate patient comfort. Considering the facts, this study was aimed to compare the lateral and posterior approaches of ultrasound-guided TAP block after LUCS.

METHODS

This randomized clinical trial (RCT) was done in 90 patients who underwent elective lower uterine cesarean section (LUCS) under subarachnoid block in 600 bedded Khwaja Yunus Ali medical College and Hospital, Sirajganj, Bangladesh during the period of July, 2020 to June, 2021. Patients scheduled for LUCS with subarachnoid block, LUCS done by pfannenstiel incision, aged between 20-40 years and American Society of Anesthesiologists (ASA) physical status I and II were enrolled for this study. Infection on the site of block, psychological disorder, requiring general anaesthesia, coagulopathy, neuropathic pain, addiction to any substance, patient under treatment with anti-depressants and allergic to local anesthetic agent were excluded from this study. Informed written consent was taken from every study subject.

Patients were randomly assigned into two equal groups (45 for each group) by randomly selecting their sealed opaque envelopes. The patients were fasting for 6-8 hours before surgery. Immediately after operation, the Group-A received ultrasound guided TAP (Figure 1) in lateral approach (Figure 2). The Group-B in the same period received ultrasound guided TAP in posterior approach (Figure 3). In both the group, the patients were administered injected 20 ml of 0.25% plain bupivacaine in each side.

At the day of surgery, patients were received into operation theatre. The baseline parameters were measured, an IV channel was opened and preloading was done with the Hartman's solution

of about 500ml. The patients were anaesthetized with help of subarachnoid block. In sitting position on the table, lower back of the patients was disinfected with the 10% povidone iodine and the skin and the needle track between L₃-L₄ was anaesthetized with hypodermic needle. Then subarachnoid block was performed with 25G Quincke spinal needle using 0.5% bupivacaine heavy (0.3mg/kg) in both the groups (group-A and group-B). The monitoring of the patient was performed during operation and was continued in the postoperative period. Immediately after completion of surgery, the target site was identified and disinfected with povidone iodine. Then with the guidance of ultrasound with high frequency (6-8MHz) linear ultrasound probe, the three muscle layer of abdominal wall was identified and needle was introduced. After aspiration, TAP block was performed with the help of 21G 100mm needle using 20 ml of 0.25%

plain bupivacaine solution bilaterally and the solution was injected with intermittent aspiration test to prevent intravascular injection (first 2ml to test easy flow and hypersensitivity). Thereafter, the needle was withdrawn and sterile dressing was placed. In group- A, block was performed in lateral approach where the patient was in supine position. Here ultrasound scanning was done along mid axillary line and needle was introduced in a point between costal margin and iliac spine in mid axillary line. In group B, block was performed in posterior approach, where the patient was turn to the semi-lateral position. A high frequency (6-8 MHz) linear probe was placed along the posterior axillary line and after finding the posterior part of TAP, 20ml of 0.25% bupivacaine was injected in the posterior junction of the transverses abdominis plane through triangle of petit on both sides.

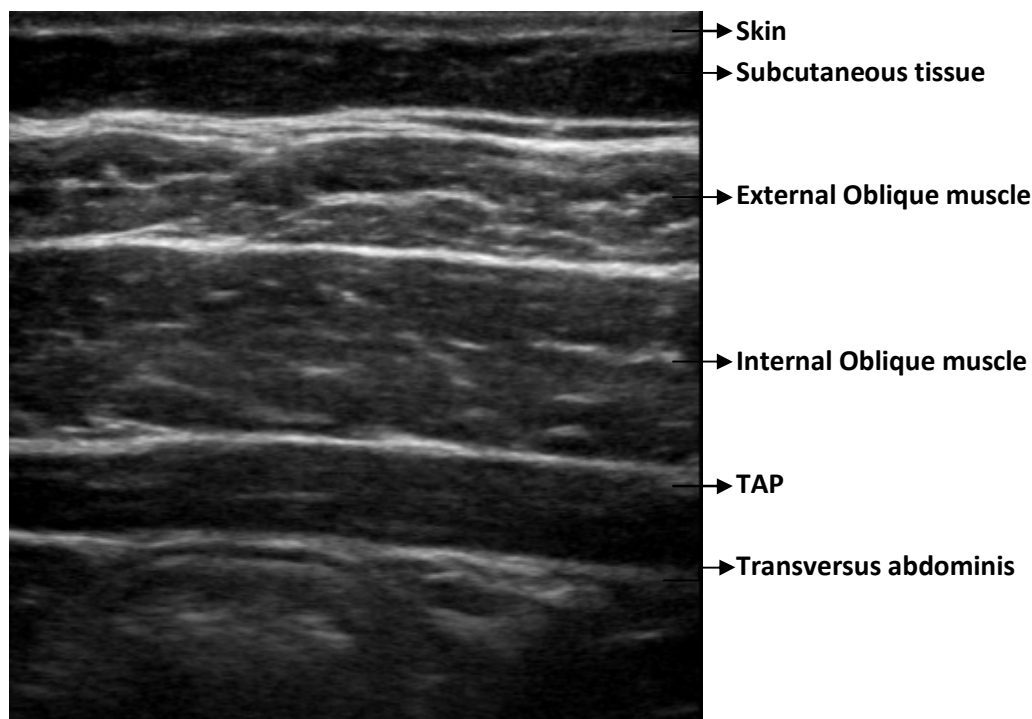


Figure 1: Ultrasound anatomy of TAP block

In the postoperative room, rescue analgesia may or may not be required. If required, it was maintained in both groups with intravenous Injection morphine through patient controlled analgesia (PCA) device. The PCA device was

programmed in the following order-Initial loading dose infusion of (60 mcg/kg) and preset dose of 20 mcg/kg per demand with lockout interval of 10 minutes and one hour dose limit 4mg. The PCA device was designed only to reach the endpoint

of consumption during the first 24 hours after surgery. Intravenous ondansetron 4-8 mg was given when required.

All patients was taken into Post Anesthesia Care Unit (PACU) and observed pain intensity by visual analogue scale (VAS, Figure 4) after 1, 2, 4, 6, 12 and 24 postoperative hour. Patient's satisfaction regarding postoperative analgesia was measured likert scale in which there is 5 parameter 'very unsatisfied', 'unsatisfied' 'neutral' 'satisfied', 'very satisfied' .

The study outcomes were recorded 1, 2, 4, 6, 12, 24 hours after TAP block. The patients were also be observed during study period for presence of any complication like bradycardia, tachycardia (Heart rate less than or more than 20% of preoperative level respectively on two consecutive readings), hypotension and hypertension (Mean Blood Pressure less than or more than 20% of preoperative level respectively on two consecutive readings), sedation, nausea, vomiting.



Figure 2: Site of Lateral TAP block along mid axillary line



Figure 3: Site of posterior TAP block, triangle of petit

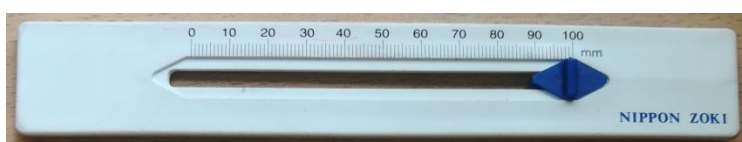


Figure 4: Visual analogue scale (VAS)

Study was approved by the ethical review committee of Khwaja Yunus Ali medical College and Hospital. Statistical analysis was carried out by using the Statistical Package for Social Sciences version 22.0 for Windows (SPSS Inc., Chicago, Illinois, USA). Qualitative variables of this study were expressed as percentage. Quantitative variables were expressed as Mean±Standard deviation (SD). Level of significance was done by student *t* test and Chi-square test. The results were presented in tables, figures, and diagrams

etc. A *p*-value <0.05 was considered as statistically significant.

RESULTS

The mean age was found 25.58±3.09 years and 25.24±3.28 years in group A and group B respectively. The mean weight was 60.51±4.63 kg in group A and 59.49±5.57 kg in group B. The mean age and weight were not statistically significant (*p*>0.05) between two groups.

Table I: Distribution of the study subjects by pain intensity measured by VAS (n-90)

Pain intensity (VAS) at rest (in cm)	Lateral approach Group-A (n-45) Mean±SD	Posterior approach Group-B (n-45) Mean±SD	<i>p</i> -value
1 Hours after TAP	0.71±0.72	0.73±0.65	0.890 ^{ns}
Range (Min-max)	0-3	0-2	-
2 Hours after TAP	1.74±0.66	1.16±0.8	0.001 ^s
Range (Min-max)	0-3	0-2.2	-
4 Hours after TAP	3.48±0.27	3.08±0.44	0.001 ^s
Range (Min-max)	2.8-3.9	1.9-3.9	-
6 Hours after TAP	4.22±0.34	3.8±0.17	0.001 ^s
Range (Min-max)	4-5	3.5-4	-
12 Hours after TAP	3.87±0.23	3.5±0.16	0.001 ^s
Range (Min-max)	3-4.1	3-3.9	-
24 Hours after TAP	3.61±0.21	2.56±0.41	0.001 ^s
Range (Min-max)	3-4	2-3	-

s=significant; ns=not significant; *p* value reached from Unpaired *t*-test

Table I shows distribution of study patient by pain intensity measured by VAS at rest. Where after 2, 4, 6, 12 and 24 hours there were statistically significant (*p*<0.05) between two groups.

Post-operative complications like sedation, nausea and vomiting were less in patients receiving TAP in posterior approach than lateral approach (Table II).

Table II: Postoperative complications within study subjects (n-90)

Post-operative Complications	Lateral approach Group-A (n-45) Frequency (%)	Posterior approach Group-B (n-45) Frequency (%)	<i>p</i> value
Hypotension	1(2.2%)	0(0.0%)	0.001 ^s
PONV	18(40.0%)	6(13.3%)	
Sedation	25(55.6%)	10(22.2%)	
No complication	01 (2.22%)	29 (64.44%)	

s= significant, postoperative nausea and vomiting (PONV) Statistical analysis was done by Chi-square test.

In this study, most of the patients were satisfied (24, 53.3%) regarding post-operative analgesia in TAP with posterior approach (Table III).

Table III: Distribution of the study patients by patient's satisfaction regarding Analgesia (n-90)

Level of Satisfaction	Lateral approach Group-A (n-45) Frequency (%)	Posterior approach Group-B (n-45) Frequency (%)	p value
Unsatisfied	8(17.8%)	3(6.7%)	0.008 ^s
Neutral	25(55.6%)	15(33.3%)	
Satisfied	12(26.7%)	24(53.3%)	
Very satisfied	0(0.0%)	3(6.7%)	

s = significant, statistical analysis was done by Chi-square test

DISCUSSION

Postoperative management is necessary to reduce postoperative complications, morbidity and mortality. Several study found transversus abdominis plane (TAP) block is very effective in the management of postoperative pain after Lower uterine cesarean section (LUCS).⁴

In this study, the mean pain intensity measured by visual analogue scale (VAS) in first few hours of TAP block is not statistically significant ($p > 0.05$) between posterior and lateral approach. But after 4, 6, 12 and 24 hours of TAP, VAS at rest was statistically significant ($p < 0.05$) between two groups.

Lower uterine cesarean section was done under subarachnoid block. The effect of subarachnoid block may persist 2-3 hours after operation.¹¹ So, there was less or no pain in first few hours of TAP block. May be this is the cause why there was no statistical significant differences found in VAS at rest between two groups of TAP block. After 3-4 hours of subarachnoid block, generally there were no persisting effects of nerve block, but the TAP blocks already started to work, and effectiveness of TAP block was evident. VAS score at rest in patients having posterior TAP block was lesser than lateral TAP.

The result of this study was consistent with Faiz et al.¹² They compared analgesic effects of ultrasound-guided posterior and lateral TAP block in patients undergoing LUCS under subarachnoid anesthesia and found VAS score at rest was significantly lower in the posterior block group after 6, 12 and 24 hours operation but the mean values of VAS during coughing was significant only 12 hours after block between two groups.

In case of caesarean section, pregnant patients having high level of estrogen and progesterone, which increases pain threshold level.¹³ So that

patient could not feel minute pain. This may be the cause that before 6 hours postoperatively they could not found any significant differences between lateral and the posterior approach of TAP block. This may also the cause for not finding difference of VAS scores after 12 hours of postoperative period. Using TAP block for pain reduction after hysterectomy improved the recovery of patients.⁷ They emphasized that ultrasound-guided posterior TAP block compared with the lateral TAP block was more effective in pain control after abdominal surgery.

In a meta-analysis done by Abdallah et al.⁴ reveals, compared with the control, posterior TAP block technique reduces the rest pain VAS score by 17 mm at 12 hours ($p < 0.00001$), by 13 mm at 24 hours ($p = 0.005$), by 18 mm ($p < 0.00001$) at 36 hours. When a TAP block was performed using the lateral technique, rest pain VAS scores were reduced by 5 mm at 12 hours ($p < 0.0001$), but there is no differences in rest pain scores at 24 and 36 hours postoperatively between lateral and control groups. But they could not compare lateral and posterior of TAP blocks directly.

In early post-operative period following LUCS, patient may develop several complications like sedation, nausea, vomiting, hypotension and respiratory depression. Patient satisfaction depends on types and severity of complications. This study showed no incidence of respiratory depression, local anesthetic toxicity, bradycardia, hemorrhage, pruritus within 24 hours of TAP blocks in both groups of patient.

Results of this study also showed, morphine related side effects was evident in both groups of patients, among them sedation and postoperative nausea-vomiting was common. Morphine has side effect like sedation, nausea, vomiting. So the group of patient consumed more

morphine, they had more incidence of morphine related side effect like sedation, nausea, vomiting etc. The patients of posterior TAP blocks had relatively less morphine than the lateral TAP block patients. So, sedation and postoperative nausea-vomiting was more common in lateral TAP than the posterior TAP and the differences were statistically significant ($p < 0.05$) between two groups. Abdallah et al.⁴ showed the incidence of postoperative nausea and vomiting is similar between the TAP block and the control group for both the posterior and the lateral techniques at 24 and 48 hours. The incidence of pruritus in the lateral TAP block technique was increased at 24 hours compared with control, but there was no difference at 48 hours. There were no data on the incidence of pruritus for the posterior technique. The incidence of sedation was reduced at 24 hours and at 48 hours compared with the control group when the posterior TAP block technique was performed; but there was no difference from control at 24 hours with the lateral technique. Cause of this may be, both posterior and lateral TAP patient were sensitive to morphine and nausea, vomiting occurs similarly in both type of TAP. But posterior TAP gives prolonged analgesia so in late postoperative period less amount of morphine required. So, there are fewer incidences of sedation and pruritus in posterior TAP patients. In this study there was very less incidence of sedation in late part of postoperative period. This study showed that, patient's satisfaction regarding post-operative analgesia after 24 hours of TAP was higher in the patients having posterior TAP block. More percentage of patients was satisfied in posterior TAP block group than lateral TAP block. The patients had more analgesia and less nausea, vomiting, got more comfort and they were more satisfied, which is consistent with Faiz et al.¹². They also found patients' satisfaction was significantly ($p < 0.05$) higher in the posterior group than patients having lateral TAP block. This study findings suggested that, TAP block in posterior approach provided effective and longer duration analgesia than lateral TAP block and patient's satisfaction regarding was also better. Several possible explanations may account for these findings. Firstly, injection in posterior area of TAP probably results in the blockade of lateral

cutaneous branches of thoracolumbar nerves before branching or anastomosis.^{9,10} Secondly, the posterior approach and not the lateral approach spreads the local anesthetic regionally and in a retrograde fashion in the paravertebral space covering from T₄ to L₁ within 4 hours after injection and potentially blocks a few degrees along the thoracolumbar sympathetic system.¹⁴ Evidence suggests that the reason for the posterior approach to achieve faster and longer analgesic effect is the role of sympathetic nervous system in pain management immediately after surgery.

Finally, the posterior TAP block injection may causes the formation of a depot or focus of local anesthetic in the neurofascial TAP plane. This depot of local anesthetic perhaps also justifies the better effect in posterior approach.

CONCLUSION

Transversus abdominis plane (TAP) block in posterior approach provided considerably good patient satisfaction than lateral approach after lower uterine segment cesarean section (LUCS) in terms of good post-operative analgesia and less complications. This study suggested to routine practice of TAP in posterior approach during LUCS.

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Bilateral Wilms Tumor in Female Child of Nine Months

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ABSTRACT

Among malignant neoplastic lesion of childhood, Wilms tumor is the most common malignant and approximately five to seven percent of these tumour present as bilateral disease. This bilateral tumour usually affects more often female patient. At present, bilateral disease is managed with pre-operative chemotherapy at the time of diagnosis followed by nephron-sparing surgery. The recent literatures revealed no case with bilateral involvement. For this reason, we discussed this case with bilateral Wilms tumour (BWT) in a nine months old female patient as a rare one. Management of bilateral Wilms tumor needs experienced radiologist who are familiar with imaging of nephrogenic cells, histopathologist who critically analyze cell line, pediatric surgeon dedicated for nephron-sparing surgery and oncologist with clear knowledge to prevent recurrence.

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INTRODUCTION

Wilms tumour is one of the commonest malignant renal tumour of childhood. It was estimated in USA that eight cases of this tumour per million children less than fifteen years of age per year. Recent management includes unilateral nephrectomy with systemic chemotherapy and associated ionizing radiation.^{1,2} Due to improved surgical techniques, prognosis of this lethal tumour improved. The overall survival rate of localized disease is currently greater than 90%. About five to seven percent of tumour present with bilateral disease either synchronously or metachronously.³ Management of a child with bilateral Wilms tumour (BWT) is very challenging. Preservation of the maximum amount of renal parenchyma is

needed to prevent renal failure, but complete resection is required to optimize the chances for cure of the malignancy. This tumour arises from mesodermal precursors of the renal parenchyma, increasingly gene loci are being implicated on chromosome 11 (WT1: 11p13 and WT2: 11p15) as well as WTX on chromosome X, B-catenin on chromosome 3 or TP53 on chromosome 17.⁴ On gross inspection, these tumours are usually well-circumscribed or macrolobulated. Haemorrhage and central necrosis are common findings. Abdominal X-ray reveals a large soft tissue opacity displacing bowel. Ultrasound is a very much helpful procedure and will be the primary investigation of choice. It is helpful to localize the mass to the kidney and also distinguish from other causes of renal masses. Doppler

examination can be performed to examine the renal vein and Inferior vena cava (IVC) to assess for the presence of tumour thrombus.^{5,6} Computed tomography (CT) scan is useful for characterizing renal tumours in children. CT scan done in portal venous phase is sufficient to characterize Wilms tumour. These tumours are heterogeneous soft-tissue density masses with infrequent areas of calcification and fat-density regions. Enhancement is also patchy and allows for better delineation of the relationship between the mass and kidney. Ten to twenty percent (10-20%) of cases have lung metastasis at the time of diagnosis.^{7,8} Where MRI is available, it is the investigation of choice for staging since it does not involve ionizing radiation. It is also one of the accurate modality in assessing for IVC involvement where protocols have been optimized.¹ These tumours appear heterogeneous on all sequences and frequently contain blood products.¹⁻³ Due to late metastasis in the bones, its scans are not consider as routine investigation. F-18 FDG PET-CT is increasingly used as a problem-solving tool and to distinguish scar tissue from residual active tumour.^{6,8} In case of unilateral Wilms tumour, surgery or preoperative chemotherapy followed by surgery is done. In local extensive disease or bilateral involvement, chemotherapy is choice of treatment. Radiotherapy has a limited role, but may be employed in cases of peritoneal spread or incomplete resection.⁸ Cure is now possible in ~90% of cases. Recurrence is seen both within the tumour bed, as well as distally within the lungs or liver.^{6,8} Response depends on rhabdomyoblastic differentiation, even though it is a favourable

histological subtype.⁷ Advanced functional imaging using apparent diffusion coefficient is now applied which has the potential to make distinction of tumour. Patients with bilateral disease need to maintain maximal renal function to ensure longevity requiring advanced imaging and surgical techniques.^{2,8,9}

The Case

A nine months old female child hailing from Sirajganj, Bangladesh attended in the Department of paediatric outdoor of Rafatullah Community Hospital (TMC and RCH), Bogura, Bangladesh with huge abdominal distension and flank mass. On examination patient was not anaemic and hypertensive. Per abdominal examination found upper abdominal mass but its lower margin was not reachable. Ultrasonography (USG) of whole abdomen revealed bilateral renal mass measures about 71x63 mm on right and about 80x63 mm on left side (Figure1). Sonographic differentials were bilateral adrenal mass, favoring medulloblastoma. USG guided FNAC from both kidneys revealed round blue cell tumour suggesting Wilms tumour. Unfortunately, slides were lost from patient's parent during travelling from Sirajganj to Bogura. Only cytological report was found. Contrast CT scan of whole abdomen showed lobulated mildly enhancing mass arising from upper-mid pole of right kidney (about 78x69 mm) and anterior aspect of mid pole of left kidney (about 85x67 mm). Adrenal glands and liver were separated from the lesion (Figure 2). No pulmonary lesion was found. From above findings, it was concluded that this was a case of bilateral Wilms tumour. We consulted with oncologist and paediatric surgeon for academic interest.

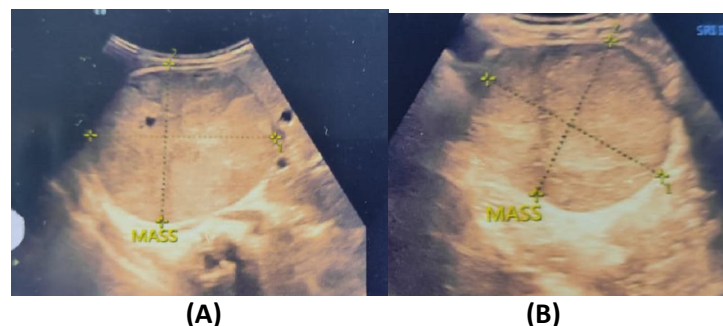


Figure 1: Ultrasonography showing right (A) and left (B) renal solid mass

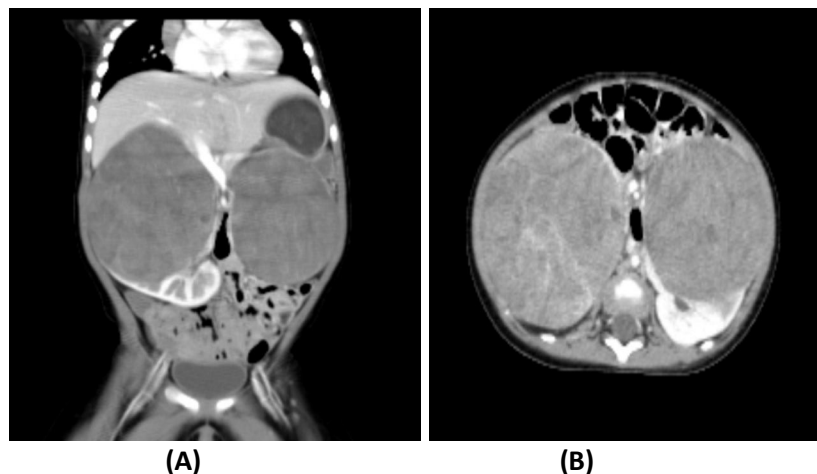


Figure 2: (A) Contrast enhance coronal reformatted CT scan of whole abdomen showing mildly enhancing bilateral renal mass. (B) Contrast enhances axial CT scan of whole abdomen showing mildly enhancing mass involving both kidneys.

DISCUSSION

Wilms tumours are largely heterogeneous solid masses which displace adjacent structures. Occasionally they may be mostly cystic or have calcifications.⁵ In this case; tumours were solid with no local invasion or evidence of metastasis. It typically occurs in early childhood (1 to 11 years) with peak incidence between three and four years of age¹ but the age of this case was nine months. There is no recognized gender predilection, but in female the presentation is a bit later.³ Clinical presentation is typically with a painless upper quadrant abdominal mass. Haematuria is seen in ~20% of cases³ and pain is uncommon. On examination, hypertension due to excessive renin production is found in up to 25% of patients.¹ This case was presented with huge abdominal distension with flank mass. Patient was non-hypertensive and not anaemic. Metastasis are most commonly to lung (85%), liver and local lymph nodes.⁷ Similar to renal cell carcinoma, thrombus into the renal vein, IVC and right atrium are also characteristic of advanced disease. In this case, no metastasis is visualized in lung fields or evidence of renal venous thrombosis. Unilateral Wilms tumours are treated by a combination of nephrectomy and chemotherapy. Occasionally, chemotherapy can be administered prior to surgery to downstage the tumour.⁵ This is especially useful when tumours are bilateral. As per consultation with oncologist, chemotherapy was advised for this case.

CONCLUSION

Wilms tumour is a common childhood malignancy. Bilateral involvement of this tumour is very rare and treatment is challenging. So, collaboration of concerned specialists is required for its suitable management.

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Conflict of interest: Not declared.

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- iii. **Results**
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Introduction

Summarize the rationale for the study with pertinent references. The purpose (s) of the study should be clearly elicited.

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Identify type of study and describe the study subjects and methods used with methods of statistical analysis. Cite reference (s) for standard

study and statistical methods. Describe new or modified methods. Give proper description of the apparatus (with name and address of manufacturer) used. **Generic name of drug must be given. Manuscripts that describe studies on human must indicate that the study was approved by an institutional Ethical Committee and that the subjects gave informed consent.**

Results

Present only important findings in logical sequence in the text, tables or illustrations with relevant statistics.

Discussion

Emphasize new and important results and the conclusions that follow including implications and limitations. Relate observations to other relevant studies.

Conclusion

Include brief findings and authors suggestions on basis of findings of study.

Acknowledgments

List all sources of funding for the research with contributions of individuals.

References

Be consistent with your referencing style across the document. Accuracy of reference data is the author's responsibility. Verify all entries against original sources especially journal titles, inclusive page numbers, publication dates. All authors must be listed if six or less than six. Use et al, if more than six. If a work has more than one author and you want to cite author names in your text, use et al. after the first author. Reference number should be placed outside or after full stops and commas, inside or left of colons and semicolons as superscript. A hyphen should be used to link number- which are inclusive,³⁻⁷ and a comma used where numbers are not consecutive.^{3,7,11} There should be no spaces between commas or dashes. Personal

communications, unpublished observations, and submitted manuscripts must be cited in the text as “[Name(s)], unpublished data, 20xx).” Abstracts may be cited only if they are the sole source and must be identified in the references as “Abstract”. “In press” citations must have been accepted for publication and add the name of the journal or book including publisher. **Use Vancouver style, for example:**

1. World Health Organization (WHO). WHO Recommendations: Low Birth Weight: preventing and managing the Global Epidemic. Geneva, Switzerland: WHO, 2000 (Technical Report Series no.894)
2. Rashid M. Food and Nutrition. In: Rashid KM, Rahman M, Hyder S, editors. Textbook of community Medicine and Public Health. 4th ed. Dhaka, Bangladesh: RHM Publishers; 2004. p. 156-160.
3. Bagher L, Alireza M, Abbas AK, Arash HN, Akbar S, Amir B, et al. Peak Bone Mass of Iranian Population: The Iranian Multicenter Osteoporosis Study. J Clin Densitom. 2006; 9(3): 367-374. doi:10.1016/j.jocd.2006.05.001.
4. Hasanuzzaman M. Diagnosis of acute appendicitis and evaluation through modified Alvarado Score. [FCPS dissertation]. Dhaka: Bangladesh College of Physicians and Surgeons; 2004.

5. Jarrett RJ. Insulin and hypertension (Letter). Lancet. 1987; ii: 748-749.
6. Reglic LR, Maschan RA: Central obesity in Asian men. J Clin Endocrinol Metab. 2001; 89: 113-118 [Abstract].
7. Hussain MN, Kamaruddin M. Nipah virus attack in South East Asia: challenges for Bangladesh. Prime Med Coll J. 2011; I (1): i-ii [Editorial].

Tables:

Each Table must be typed on a separate page. The table number should be followed by a Roman brief informative title. Provide explanatory matter in footnotes. For footnotes use symbol in this sequence; *, **, +, ++, etc.

Figures:

Line drawings, photomicrographs, colour prints and halftones should be camera ready, good quality prints. Submit only originals of laser prints, not photocopies. Original figures must be submitted indicating figure number, short figure title on top of figure lightly in pencil. Any abbreviations or symbols used in the figures must be defined in the figure or figure Legend.



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