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## Instructions to the Authors

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## Editorial

### Quality Assurance of Medical Education in Bangladesh

Md. Zahirul Islam<sup>1</sup>, Md. Faizul Bashar<sup>2</sup>

The quality assurance is one of the fundamental things that any educational system has to maintain. Medical education is not any exception. Medical education system needs extensive training and supervision in order to build the future doctors who will serve health care delivery in Bangladesh. So for the improvement of the standard of the health care system in Bangladesh we have to maintain the standard quality assurance in assessment methods as well as in teaching-learning at medical colleges.

Quality assurance is implied as an accountability to the public and meeting the requirements of the external standards and an essential for enhancing and maintaining the quality of teaching and learning at an institution.<sup>1</sup> Quality assurance includes both quality management and quality control. Where quality control ensures that a manufactured product or the performed service adheres to a defined set of quality criteria. Quality assurance includes all the policies, standards, systems and processes that are in place to maintain and improve the quality of medical education and training.<sup>1</sup> Some frameworks are required to review and evaluate the quality assurance of medical education. For quality assurance in medical education system of Bangladesh organizational framework as well as operational framework has important roles in individual context. The councils and committees are the organizational

framework while some processes and procedures are the operational framework.<sup>2</sup> Organizations e.g. Directorate General of Medical Education (DGME), Center for Medical Education (CME) at national level can monitor the overall quality assurance. At the same time institutional quality assurance body can work at institutional level for the implementation of national agenda. Institutional quality assurance body may be formed with academic council, academic co-ordination committee, phase co-ordination committee, subject coordinators and student representatives.

Operational framework are the procedures by which MBBS course standards are monitored. In this framework course appraisal, faculty development and review, external review is necessary.

Main stakeholders of the MBBS course are the students. So, students should be the principle focus during the quality assurance process. During the course appraisal phase of the operational framework satisfaction level of the students should be analyzed according to the phase.

The teaching learning of MBBS course is facilitated by the faculty. So faculty development and review is another important part of quality assurance in medical colleges. Head of the departments should arrange the development and review activities within the department and phase co-ordination committee should do this among the phases. Academic council of the

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medical college should monitor the overall activities of faculty development and review. During the quality assurance process one medical college should be reviewed by peer medical colleges. This external review system will improve some dark corners that is not seen by the college stakeholders. It can easily be done by the external examiners during each examination session.

For quality assurance in medical colleges these operational frameworks should be practiced under meticulous supervision in organizational framework. Best practices of the quality assurance will change our current

medical education system towards more positive direction.

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**Review article**

**Management of Epistaxis: A review**

Md. Zahirul Islam<sup>1</sup>, Mst. Munira Akter Khanam<sup>2</sup>, Md. Afzal Karim<sup>3</sup>, Mohammad Golam Sagir<sup>4</sup>

**ABSTRACT**

Management of epistaxis has been evolved since ancient history. Still now the first aid of pinching the nasal ala is practicing all over the world. Indirect, direct and surgical management is practiced clinically in the hospital setting. Choice of therapy depends on many factors. Sometimes more than one therapy is necessary to control of nose bleeding. A variety of reasons cause epistaxis like trauma, inflammation, infection, tumor and some systemic causes. Many of the cases are idiopathic. It is not proven whether hypertension is the cause or the effect of epistaxis. In anterior epistaxis the bleeding site is easily identifiable, but in posterior epistaxis it is very difficult to identify the exact point. Sometimes epistaxis present as life threatening condition, other is minor ailment. So it difficult to set a single remedy to handle the epistaxis. Airway is first concern for managing of epistaxis. Sometimes blood transfusion is needed to overcome the loss. Development of endoscopic procedure has changed the scenario of epistaxis management. Further achievement is done by embolization technique. In some vascular phenomenon like hereditary hemorrhagic telangiectasia bleeding control is challenging despite of these modern techniques.

**Keywords:** Epistaxis, Management of Epistaxis

**INTRODUCTION**

There are several emergencies in the otolaryngology practice. Among them epistaxis or bleeding from the nose is one of the most frequent emergencies.<sup>1</sup> Sometimes nose bleeding becomes so severe that it may endanger the life. Epistaxis affects both young and elderly. Peaks occurs below age ten and above age of forty years.<sup>2</sup> This blood comes out from the nose as well as from the mouth. Some posterior bleeding is not directly coming out rather is swallowed. This swallowed blood comes out as mixed with vomitus, cough or it can present as black coloured stool. People get scared and often it becomes real challenge for the physician. To finding out the source of bleeding is very difficult. About 70-80 percent cases it remains unidentified.<sup>3</sup> Management of

epistaxis depends on whether the source is identified or not. If the source of bleeding is identified and the management is directed to the identified source, then it is known as direct therapy. And if the source of bleeding is not identified then the management of epistaxis is called indirect therapy.<sup>4</sup> In recent years with the advancement of technology idiopathic cases are now declining.<sup>3</sup> In that situation indirect therapy of epistaxis management is also declining. And the direct therapy is practiced more confidently as the source of is secured here.<sup>5</sup> In spite of having difficulties in finding the source of bleeding, search for the identification of the source is always considered in best clinical practice.

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### **Vascular Anatomy**

Nasal mucosa has many vascular functions and its vascular supply comes from the terminal branches of both internal and external carotid arteries.<sup>6</sup> And it is extremely vascular mucosa due to its multiple anastomoses. These vascular anastomoses form the plexuses. Some are arterial plexuses and some are venous. Vessels the ipsilateral side contribute to form the plexuses but sometime contralateral vessels have some contribution to form a plexus. The vascularity of the nasal mucosa comes from the facial and maxillary branch of external carotid and the ethmoid branches of internal carotid artery. The branch of facial artery that supplies the nose is the superior labial artery. This superior labial artery supplies the anterior nasal septum. And the sphenopalatine artery branch of maxillary artery is the key branch that supplies the nose, especially in the posterior part. The sphenopalatine artery enters the nose through sphenopalatine foramen. It has two branches naming posterolateral and the septal. This artery has significant role in posterior epistaxis. Another branch of maxillary artery that supply nose is the greater palatine artery. This greater palatine artery is the branch of descending palatine branch of maxillary artery. This greater palatine artery enters into the nose through the incisive foramen and supplies the anterior part of the nose. The mucosa of the nose is supplied by the internal carotid artery through its first branch the ophthalmic artery. The ophthalmic artery gives the ethmoid branches. The anterior ethmoidal artery and the posterior ethmoidal artery. These arteries enters into the nasal cavity from the cranial cavity through bony tunnels. The anterior ethmoidal artery enters through the anterior ethmoidal canal that passes anteromedially.

This artery is very much important during endoscopic sinus surgery. Bleeding from this artery during endoscopic sinus surgery sometimes results into blindness. As transection of the artery retracts back into the orbit. Posterior ethmoidal artery passes through the posterior ethmoidal canal to enter the nasal cavity. After entering into the nasal cavity, the posterior ethmoidal artery divides into the lateral and medial branches. The lateral and medial branches of the posterior ethmoidal artery supply the upper part of the lateral wall and the septum respectively. The microvasculature of nasal mucosa has a sub epithelial capillary network, and these capillaries have fenestrations. Another part of the microvascular system is the distended venous sinuses.<sup>7</sup> These blood vessels are controlled by autonomic nerves.

### **Anterior and posterior epistaxis**

On the basis of the bleeding source the epistaxis is classified as anterior and posterior epistaxis. But it is very much difficult to define the anterior epistaxis from the posterior epistaxis. As because there are no clear-cut anatomical structures that can divide the nasal cavity into anterior and posterior part. When the source of bleeding can be identified with head-light, then some authors called it anterior epistaxis. In case of anterior epistaxis, it can be managed with anterior nasal packing.<sup>5</sup> But others name it differently. The proposal of Mcgrary is very straightforward.<sup>3</sup> He used an anatomical landmark to define the anterior and posterior epistaxis. The landmark he proposed is the pyriform aperture. He called anterior epistaxis when blood comes from the in front of the plane of pyriform aperture. That is the soft part of the nose. And posterior epistaxis when blood comes from posterior to the plane of the aperture.<sup>3</sup> In case of anterior epistaxis blood comes out

from the anterior parts of the nose, especially from the Little's area.<sup>8</sup> Bleeding from many sub sites are considered as posterior epistaxis. Sub sites of posterior epistaxis are the posterior part of the septum, lateral nasal wall and floor of the nasal cavity. This classification of anterior and posterior epistaxis helps to define the direct and indirect therapy of epistaxis management.

In case of children epistaxis is seen usually anterior epistaxis and the mucocutaneous junction of the nasal septum is the commonest site of bleeding. In childhood recurrent epistaxis von Willebrand disease should be excluded. And in adolescent male should exclude the angiofibroma.

Many of the epistaxis causes cannot be identified. Sometime systemic causes can produce epistaxis. Hypertension may be one cause, but clear evidence does not support it. Patient with epistaxis may have sympathetic outburst seeing blood in front of him this may cause rise of blood pressure. It should be established whether hypertension is the cause or the effect of epistaxis. Patients having hepatic and renal impairment sometimes present with epistaxis. In rare situation women having endometrial tissues into the nose may have epistaxis during menstruation.

#### **Indirect Management**

Nasal packing is one of the most practiced indirect therapies for the management of epistaxis. Nasal packing can be placed in anterior and posterior parts of the nose. When nasal pack is inserted through the anterior nasal aperture and it is placed within the nasal cavity, then it is called as anterior nasal packing. When nasal pack is given in the postnasal space or in the nasopharynx then it is known as posterior nasal packing. Insertion of anterior nasal pack is easier than the posterior nasal pack.

For this reason, anterior nasal packing is most frequently practiced in management of epistaxis. For application of anterior nasal packing nose should be cleaned then ribbon gauze soaked with liquid paraffin is inserted in both nasal cavities. It is inserted layer by layer in folded fashion along the floor of the nose. Nasal pack should not be kept for a long time because of some severe complications. And systemic antibiotic should be given along with anterior nasal packing. It should be removed within 2-3 days. The complications of anterior nasal packing are pain during insertion and removal. Anterior nasal packing itself can damage the nasal mucosa as a result it turns into further bleeding. After removal of anterior nasal packs sometimes synechia has been developed. To reduce this type of complications there are some modifications in the techniques for anterior nasal packing like mucosal coverage with aluminum foils.<sup>9</sup> Posterior nasal packing is effective indirect measure that is used in hospital setting and higher expertise is needed for its application. It is also called surgical management. Due to its complexity alternate technique for management of epistaxis has been searched. A therapy of application of hot water is practiced over hundreds of years. Irrigation with warm water about 50°C hot is used as a therapy. Hot water irrigation is producing less trauma to nasal mucosa compared to posterior nasal packing.<sup>10</sup> But hot water irrigation is not risk free. Common complication is encountered during hot water irrigation is aspiration. To minimize this complication some modification of hot water irrigation has been proposed. One of the modifications is the introduction of catheter in the nasal cavity and the balloon is placed in the posterior choana so that water is prevented to enter into the airway.<sup>11</sup> This modified technique

significantly reduces the risk of aspiration during hot water irrigation for epistaxis management. Fibrinolytic therapy like Tranexamic Acid and Aminocaproic Acid can be used as systemic therapy.<sup>12</sup> Tranexamic acid can be used in both topical and systemic form.<sup>13</sup> Haemorrhage can be controlled with locally applied haemostatic agents. For the management of nasal bleeding it has also been practiced. A commercially available haemostatic agent FloSeal (Baxter Healthcare), is applied locally.<sup>14</sup> It showed a good result. But application of a local agent within the nasal cavity is not always easy. In case of posterior epistaxis, it is very difficult to apply such agents. But in case of the anterior epistaxis it can be used very easily. So, the control of epistaxis depends on whether the location of the bleeding source. In a study it is seen that the FloSeal has better results in anterior epistaxis than the posterior.

#### **Direct Management**

In case of anterior epistaxis as by definition the bleeding source is visible so direct therapy is frequently practiced. For the young children when blood comes from the septal mucocutaneous junction the first aid of pinching the ala is very much effective. Other direct therapies are Electro-cautery and chemical cautery like silver nitrate is used for this purpose. Use of these direct therapies like chemical cautery in the posterior part of the nose for the treatment of the posterior epistaxis is very difficult.<sup>15</sup> Because visualization is not only difficult but also bleeding itself obscures the field. To overcome this problem nasal endoscopy has an advantage that it has both bright illumination as well as the magnification.<sup>16</sup> Fiber Optic flexible nasal endoscope is used for the examination of the nasal cavity. This is very much helpful in paediatric setting. Nasal endoscope having telescope with

different angulation is used for the examination and therapeutic purpose. Nasal endoscope along with the suction apparatus helps the examiner in case of active bleeding from the nasal cavity. Clearing the blood clots with suction the nasal mucosa is visualized with the nasal endoscope then haemostasis can be done with electro-cautery. Among the different types of electro-cauteries the unipolar and bipolar cauteries are widely used. But unipolar electrocautery should be used with great caution in nasal cavity for controlling of bleeding. This unipolar electro-cautery produces more heat into the nasal cavity, this heat then transmits into the eyeball resulting in blindness.<sup>17</sup> Some electrocauteries have suctioning function along with it. That is very helpful in case of management of epistaxis, because while blood is coming from the source vessel the suction can clear it continuously. Electrocautery can be used with endoscope as well as with the headlight. Headlight is useful for anterior epistaxis and endoscope is helpful for posterior epistaxis. For the application of electrocautery in the septum it is necessary to be careful because cauterization in the both sides of the septum may produce septal perforation. Electrocautery can be done under local or general anesthesia and should not be done without any anesthesia because during electrocautery patient may feel a burning sensation. Local anesthesia can be achieved by decongestant or anesthetic agent with epinephrine.

#### **Surgical management**

When the direct and indirect therapies for the management of epistaxis are failed then some surgical interventions are required. Although posterior nasal packing is discussed in the indirect therapy section it is a surgical procedure. Other surgical

procedures are ligation of the bleeding vessel, some form of septal surgery, embolization of the bleeding vessels is practiced for management of epistaxis.<sup>3</sup>

Posterior nasal packing has some discomforts and it is poorly tolerated in elderly patients having multiple comorbidities like arteriosclerosis, hypertension, diabetes, hepatic and renal impairment.<sup>6</sup> Then the ligation of bleeding vessels has become popular. Among the ligation techniques ligation of sphenopalatine artery, ligation of maxillary artery and ligation of external carotid artery has been proposed. Recently sphenopalatine artery ligation is practiced endoscopically. External carotid artery ligation is practiced less commonly as because the nose has some contralateral anastomosing blood vessels and ligation of external carotid artery also produces cerebral ischemia. Ligation of maxillary artery is also less commonly practiced. Because Caldwell-Luc approach is needed to perform this procedure. But now-a-days maxillary artery ligation can be done endoscopically. Though it has higher success rate,<sup>18</sup> but sometimes it is difficult to find out the vessel in pterygopalatine fossa.

When bleeding from nose cannot be controlled with local measures then examination under local or general anesthesia is needed. During this procedure nasal cavity is thoroughly examined and tremendous search is done for any bleeding points. If point can be controlled with bipolar diathermy, then it is enough. But if it fails then endoscopic ligation of sphenopalatine artery can be done. Sphenopalatine artery is situated near the ethmoid crest in the middle meatus. Exposure of the artery is done by elevating submucosal flap. There are variations in the anatomy of sphenopalatine artery. It gives variable

number of branches in its course. This variation is the main cause of failure in the control of epistaxis with sphenopalatine artery ligation.

Arterial embolization has proven as an effective treatment of epistaxis. But this procedure has a risk of development of cerebrovascular accident. More risk is seen in case of embolization of internal carotid branches than that of the external carotid. This technique should be reserved only for the epistaxis that is refractory to other treatments.

Anterior ethmoidal artery gives troublesome bleeding. It may happen during trauma or surgery. This can cause blindness if hemorrhage occurs intracranially. External open approach or endoscopic approach can be used to identify and ligate the vessel.

In case of hereditary hemorrhagic telangiectasia control of bleeding is very difficult. Sometimes closure of nasal cavity may be required.<sup>19</sup>

#### **CONCLUSION:**

Identification and closure of bleeding point is the best way of controlling the epistaxis. But it is not always possible to do the best means due to difficulties in identification. So first aid, indirect as well as direct technique of management of epistaxis will remain simultaneously.

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Original article

## Presentation & Outcome of Patient with Acute MI in Patuakhali Medical College Hospital

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### ABSTRACT

**Background:** Myocardial Infarction is one of the most common causes of mortality and morbidity among the elderly patients. Myocardial Infarction (MI) patients who experiences cardiac arrest, dyspnea, or syncope in addition to typical chest pain, conduction or rhythm problems showed higher long-term mortality. This study is to evaluate patients with acute myocardial infarction (AMI) in terms of their clinical manifestations, complications, prognosis, and outcome.

**Methods:** In the cross-sectional observational study, 219 patients who presented with their first ST-elevation myocardial infarction (STEMI) within a week were included. It was carried out in the department of cardiology at Patuakhali Medical College Hospital between January 2020 and December 2020. In this investigation, patients with stable or unstable angina, AMI-related ECG abnormalities, and elevated enzyme levels who were transferred to a coronary care unit were excluded.

**Results:** The average age was  $57.6 \pm 14.4$  and the gender ratio was 1.8:1. Majority 175(79.9%) patients had chest pain followed by dyspnoea 58(26.5%), vomiting 25(11.4%), syncope 9(4.1%), sweating 43(19.6%), palpation 10(4.6%) and epigastric pain 18(8.2%). Atypical MI was found in 49(22.4%) and typical MI was 170(77.6%). Out of 219 patients, 168(76.7%) were discharge, 36(16.4%) were death, 5(2.3%) were referred and 10(4.6%) patients given STK.

**Conclusion:** Male patients made up the majority, and typical clinical symptoms included epigastric discomfort, dyspnea, vomiting, syncope, and chest pain. Patients 2.3% who had been referred had a mortality rate of 16.4%.

**Keywords:** Acute Myocardial Infarction, clinical presentation, STEMI and NSTEMI outcome.

### INTRODUCTION

Myocardial infarction is one of the leading causes of death and morbidity in the elderly. It is also known for a wide spectrum of clinical manifestations other than chest discomfort.<sup>1</sup> Myocardial infarction (MI) is most frequent cause of heart failure (HF). Three clinical presentations that differ in pathophysiology, clinical traits, and outcomes can be distinguished based on the timing of MI occurrence and HF development: (i) HF onset at the time of MI presentation; (ii) HF developing during hospitalisation for MI; and (iii) HF onset following discharge from the index hospitalisation.<sup>2</sup> According to projections, there would be 8.9 million older persons in 2030 compared to 5.9 million in 2012.<sup>3</sup>

However, little is known about acute myocardial infarction in the elderly. Prior research either underrepresented them or did not give a thorough examination of the functional and quality-of-life variables that are crucial for describing these patients and their outcomes.<sup>4-5</sup> Acute myocardial infarction (AMI) patients frequently have a clinical presentation. According to registries, up to 30% of AMI patients experience unusual symptoms such nausea and vomiting, shortness of breath, exhaustion, palpitations, or syncope.<sup>6</sup> These symptoms are more frequently seen in elderly people, women, people with dementia, chronic kidney disease, and diabetes mellitus (DM). Patients with AMI displayed symptoms other

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than a single, isolated case of chest discomfort. Regardless of the primary symptom (alone atypical chest pain, syncope, cardiac arrest, or dyspnea), these individuals had a greater cardiovascular risk profile; and were less likely to obtain invasive therapy and prescribed drugs. Additionally, both in the STEMI and NSTEMI populations, patients with concomitant cardiac arrest, dyspnea, syncope, or syncope along with typical chest pain or conduction or rhythm disorders had higher long-term mortality after full adjustment on clinical presentation and management than patients with isolated typical chest pain.<sup>7</sup>

## **METHODS**

The cross-sectional observational study comprised 219 patients who presented with their first ST-elevation myocardial infarction (STEMI) within a week and was carried out in the Department of Cardiology at Patuakhali Medical College Hospital between January 2020 and December 2020. In this investigation, patients with stable or unstable angina, AMI-related ECG abnormalities, and elevated enzyme levels who were transferred to a coronary care unit were excluded. Institutional Review Board (IRB) approval for this study's ethical conduct was obtained before it began. Before enrolment, each patient or their attendant provided written consent that was both clear and informed. Data identifying any patient was rigorously kept private, anonymous, and secret. On a pre-made questionnaire, the event's specifics were documented. Detailed risk factor and medication history analysis was done on old information. Each patient's demographic information, time of symptom onset and time of arrival at the hospital, mode of transportation, pre-monitoring symptoms, if any, and their diagnosis, presenting

symptom, door-to-diagnosis time, and reasons for delay in diagnosis, if any known risk factors and medication history, risk factors diagnosed for the first time after the event, and any prior history of known coronary artery disease (CHD) were all noted. Patients who arrived at our casualty with chest pain, giddiness, shortness of breath, and epigastric pain were assessed using a 12-lead resting electrocardiogram and cardiac enzymes (CK MB and Trop T). This study excluded participants who were sent to a coronary care unit with elevated enzymes and AMI-related ECG abnormalities. These patients' histories, physical examination results, and investigative findings were entered into the proforma. These patients' hospital-related problems were documented. The tests performed included a 2D echocardiogram, a chest X-ray, random and fasting blood sugar, a fasting lipid profile, blood urea, serum creatinine, and electrolytes.

The sample size is determined by time and resources. As the prevalence of myocardial infarction in hospital admitted patients in Bangladesh was 20.9%,<sup>8</sup> the estimated population was computed using the following statistical formula:  $n = z^2 p (1-p) / d^2$  hence the calculated sample size was 254, but we included 219 samples during the study period based on inclusion and exclusion criteria.

## **RESULTS**

The bulk of the 219 patients (88.2%) belonged to the age range 51-60 years, with a mean age of  $57.6 \pm 14$  years. Male patients outnumbered females by 142 (64.8%) to 77 (35.2%). The male-to-female ratio was 1.8:1. (Tab.I).

Table I: Demographics of the participants

Variables	Frequency	Percentage
Age (years)		
<30	11	5.0
31-40	16	7.3
41-50	37	16.9
51-60	88	40.2
>60	67	30.6
Mean±SD	57.6±14.4	
Sex		
Male	142	64.8
Female	77	35.2

Majority 175(79.9%) patients had chest pain followed by dyspnoea 58(26.5%), vomiting 25(11.4%), syncope 9(4.1%), sweating 43(19.6%), palpitation 10(4.6%) and epigastric pain 18(8.2%) (Tab.II).

Table II: Presenting symptoms of AMI patients

Presenting symptoms	Frequency	Percentage
Chest pain	175	79.9
Dyspnoea	58	26.5
Vomiting	25	11.4
Syncope	9	4.1
Sweating	43	19.6
Palpitation	10	4.6
Epigastric pain	18	8.2

Atypical MI was found in 49(22.4%) and typical MI was 170(77.6%) (Fig.1).

Majority 67(30.6%) patients both anterior and septal infarction, 51(23.3%) had inferior wall, 37(16.9%) had anterior and lateral wall, 31(14.2%) had only anterior wall, 15(6.8%) had anterior and inferior wall, 13(5.9%) had anterior, inferior and lateral wall, 5(2.3%) had only lateral wall (Tab.III).

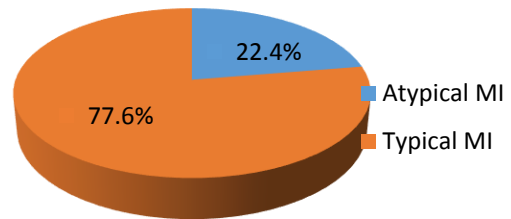


Fig. 1: Pie chart showing typical and atypical presentation of MI

Table III: Site of infarction of the study patients

Site of infarction	Frequency	Percentage
Anterior wall	31	14.2
Lateral wall	5	2.3
Inferior wall	51	23.3
Ant + Lat	37	16.9
Ant + Inf + Lat	13	5.9
Ant+ Inf	15	6.8
Ant+ Septal	67	30.6

Out of 219 patients, 168(76.7%) were discharge, 36(16.4%) were death, 5(2.3%)

Table IV: Distribution of research participants by outcome (n=219)

Outcome	Frequency	Percentage
Discharge	168	76.7
Death	36	16.4
Referred	5	2.3
STK given	10	4.6

were referred and 10(4.6%) patients given STK (Tab.IV).

## DISCUSSION

The bulk of the 88 patients in this study (40.2%), whose mean age was  $57.6 \pm 14.4$  years, belonged to the 51–60 age range. According to Chowta et al. the patients' mean age was 59.5 years.<sup>7</sup> Age groups 65 to 74 had the highest frequency of AMI atypical symptoms (30.7%), followed by 55 to 64 years (25%). No patient younger than 30 years old displayed unusual symptoms. Patients with myocardial infarction MI who did not have chest pain tended to be older (mean age 61 vs 58 years) and more likely to be women (35% vs 12.5%). The average age was reported to be  $63.1 \pm 14.0$  years by Puymirat et al.<sup>9</sup> According to Golet al. the average age was 56.3 years (range 19–98 years).<sup>10</sup>

The results of the current study indicated that there were 142 (64.8%) more male patients than female (35.2%). The male-to-female ratio was 1.8:1. Out of 60 patients, Chowta et al. reported that 40 were men (66.66%) and 20 were women (33.33%).<sup>7</sup> Puymirat et al. made a similar discovery, reporting that men made up 76.0% and women made up 24.0%.<sup>9</sup>

In this study, the majority of 175 patients (79.9%) had chest discomfort, followed by dyspnoea (58.5%), vomiting (25.4%), syncope (9.1%), sweating (43.6%), palpation (10.6%), and epigastric pain (18.2%). According to Puymirat et al. atypical chest discomfort (isolated), dyspnea, syncope, and cardiac arrest occurred at rates of 11%, 11%, 5%, and 1%, respectively.<sup>9</sup> Typical chest pain was observed in 61% of cardiac arrest patients, 64% of syncope patients, and 63.5% of dyspnea patients. Chest pain was the most prevalent presenting symptom, according to Goel et al. ( $n = 510$ , 83.7%), and other symptoms, such as syncope, were present in 99 cases (16.3%), including epigastric pain alone in 16 cases (2.6%),

dyspnea alone in 53 cases (8.7%), arm, wrist, or jaw pain without chest pain in 15 cases (2.4%), nausea or vomiting without other symptoms in 11 cases (1.8%), and other symptoms.<sup>10</sup>

According to the current study, atypical MI was detected in 49 cases (22.4%), while typical MI was found in 170 cases (77.6%). In a different study, almost 30% of MI patients had unusual symptoms. According to findings from other population studies, unusual symptoms are found in 20–60% of all MI cases. Canto and Shlipak report that patients who reported with unusual symptoms were older women.<sup>11</sup> According to Chowta et al. 12 (20%) out of 60 people experienced atypical symptoms.<sup>7</sup> In the study, 18% of AMI patients had an atypical presentation, and according to Puymirat et al. the incidence of atypical symptoms ranged from 8.4% in the GRACE study to 35.5% in the National Registry of Myocardial Infarction (NRMIs) research.<sup>9,12,13</sup>

In this study, it was found that 67 patients (30.6%) had anterior and septal infarctions in the majority of cases, while 51 patients (23.3%) had inferior walls, 37 patients (16.9%) had anterior and lateral walls, 31 patients (14.2%) had only anterior walls, 15 patients (6.7%) had anterior and inferior walls, 13 patients (5.9%) had anterior, inferior, and lateral walls, and 5 patients (2.3%) had only lateral walls. According to Chowta et al. the death rate was high in anterior-wall MI, and the anteroseptal infarction was the most common (31.6%).<sup>7</sup> 50% of the individuals with inferior-wall MI had unusual symptoms at presentation. According to the Honolulu Hawaii Heart Program Study a significant rise in painless infarction was seen in individuals with inferior-wall MI (51%).<sup>14</sup> Anterolateral wall MI was observed in 38% of patients in the study by Sandhya and Mohanraj, inferior

wall MI in 24% of patients, anteroseptal MI in 23% of patients, NSTEMI in 11% of patients, and LBBB in 4% of patients.<sup>1</sup>

Out of 219 patients, this study found that 168 (76.7%) had been discharged, 36 (16.4%) had passed away, 5 (2.3%) had been referred, and 10 (4.6%) had received STK. According to Chowta et al.<sup>7</sup>, the in-hospital mortality of MI patients who presented with typical and atypical symptoms was 16.6% and 33.3%, respectively. Age-adjusted long-term mortality for all cases was shown in the Morgolis and Kannel study to be marginally worse for instances of unrecognized MI than for cases of recognized MI.<sup>15</sup> Atypical symptoms may have been a predictor of unfavourable outcomes, according to earlier investigations. In the NRMIs trial, patients with atypical symptoms had an in-hospital death rate of 20.0%, compared to 7.2% for patients with typical symptoms.<sup>13</sup> The GRACE study likewise found that atypical symptoms were linked to increase in-hospital mortality (13.0% vs. 4.3%).

*Limitation:* It is not always easy to calculate the time it takes to go from house to hospital. Furthermore, due to the medical college situated in a district level has limited communication and ambulance services.

#### **CONCLUSION:**

Male patients made up the majority, and typical clinical symptoms included epigastric discomfort, dyspnea, vomiting, syncope, and chest pain. Patients 2.3% who had been referred had a mortality rate of 16.4%.

*Recommendation:* In order to diagnose acute myocardial infarction in the elderly and continue rapid treatment utilizing specific tests such cardiac myonecrosis markers, physicians must undergo rigorous examinations.

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Original article

**Management of Distal Tibial Fracture (AO Type 43-A) by MIPO with Precontoured Distal Tibial Locking Plate**

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**ABSTRACT**

**Background:** Tibial fractures are difficult to treat as many diverse treatment methods applicable for different fractures. Minimally Invasive Plate Osteosynthesis (MIPO) is an established technique for fixation of fractures of the distal tibia.

**Methods:** The study was conducted at the National Institute of Traumatology and Orthopaedic Rehabilitation (NITOR), Dhaka, Bangladesh from January 2014 to December 2015. 10 patients of closed distal tibial fractures (AO Type 43-A) were operated by MIPO technique with a precontoured distal tibial locking plate. The follow up period was for 6 months. The outcome was measured according to Olerud and Molendar Grading system.

**Results:** We conducted our study among young adults mean age was 42yrs and male and female participants were equal (1:1). The mean fracture healing time was 14.8±2.32 weeks. 80% patients scored satisfactory functional outcome in this treatment method. Majority (80%) of the patients returned to routine pre-injury working activities. At follow up, superficial infection occurred in 1 patient (10%), only 20% patients exhibited valgus malalignment of less than 5 degree. No deep infection, implant failure and non-union were found.

**Conclusion:** MIPO is a stable fixation and provides micromotion at fracture site that leads to early callus formation which ultimately cause early secondary union. So, we recommend MIPO technique with precontoured distal tibial locking plate for distal tibial fracture (AO Type 43-A) management.

**Keywords:** Distal tibial fracture, Minimally Invasive Plate Osteosynthesis (MIPO), Precontoured Distal Tibial Locking Plate.

**INTRODUCTION**

Treatment of distal tibia fracture is challenging because of subcutaneous location with precarious blood supply. There are many operative options for such fractures such as closed reduction and Intramedullary Inter-Locking (IMIL) nailing. Open reduction and internal fixation (ORIF) with plating, closed reduction and per cutaneous plating or external fixators including Ilizarov external fixator. Each of these techniques has their

own merits and demerits. IMIL nailing has been reported with higher rate of malunion and risk of nail propagation into ankle joint.<sup>1</sup> Wound infection, skin breakdown and delayed union or nonunion are associated with conventional osteosynthesis with plates.<sup>2</sup> Similarly, external fixators and Ilizarov fixators may lead to pin tract infection with osteomyelitis, pin loosening, malunion which is cumbersome and uncomfortable for

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patient.<sup>3</sup> Non-operative treatment is one option which avoids the risks associated with surgery, but we cannot control the distal fragments, so malunion results.<sup>4</sup>

Minimally invasive plate osteosynthesis (MIPO) offers one of the best possible option as it permits adequate fixation in a biological manner provided that overlying skin condition must be healthy. The Locking Compression Plate (LCP) provides enhanced stability in these situations. It is possible to use these plates in a minimally invasive technique without fear of secondary displacement in the absence of perfect contouring.<sup>5</sup> It acts as an internal external fixator provides micromotion at fracture site leads to secondary union. The MIPO technique preserves most of the osseous vascularity and fracture hematoma and thus providing for a more biological repair.<sup>6</sup> Patients achieve union very soon compared to other methods of treatment. Early mobilization and early weight bearing after MIPO makes encouraging to both patients and surgeons.

We aimed to manage distal tibial fractures by the MIPO technique by reviewing clinical and radiological outcomes and efficacy of the procedure.

## **METHODS**

This prospective observational study was conducted at the National Institute of Traumatology and Orthopaedic Rehabilitation (NITOR), Dhaka, Bangladesh from January 2014 to December 2015 to assess the functional outcome of management of distal tibial fracture (AO Type 43-A) by MIPO with precontoured distal tibial locking plate.

Ten adult patients of 18-60 years of age of both sexes were included in the study with closed distal tibial shaft (AO type 43A1-3). Fracture included with age less than three

weeks and soft tissue injury Tscherne grade 0 and grade 1.

Under spinal anesthesia and with antibiotic prophylaxis surgery was performed on a radiolucent table. The fracture was reduced under fluoroscopic visualization. A 3-4 cm vertical incision was given at the center of the medial malleolus and a subcutaneous tunnel was opened. The selected locking plate was tunneled proximally subcutaneously across the fracture site. The position of the plate was checked by C-arm and the locking screws were inserted when the fracture reduction was satisfactory. The incision was closed, and a well-padded plaster slab was applied. Post operatively the limb was elevated, and knee range of motion was started on the 2<sup>nd</sup> postoperative day. Cast was removed at 3-4 weeks. Partial weight bearing was started at 6-8 weeks and full weight bearing was allowed after fracture union.

Variables of interest were recorded in a structured data collection form. Data were processed and analyzed using SPSS. Functional outcome was observed according to Olerud and Molendar's ankle score criteria. Ethical clearance was taken from the ethical review board of the institute.

## **RESULTS**

A total of 10 patients of closed distal tibial fractures (AO Type 43-A) were included in the study to evaluate the outcome of fixation by MIPO technique with a precontoured distal tibial locking plate.

Most of our patients 5(50.0%) were age group 31-40 years. Mean SD age was 41.8±9.49 and ranging from 32– 51 years. (Shown in Fig. 1) Out of 10 cases, 5(50%) patients were male and 5(50%) patients were female. The male: female ratio is 1:1

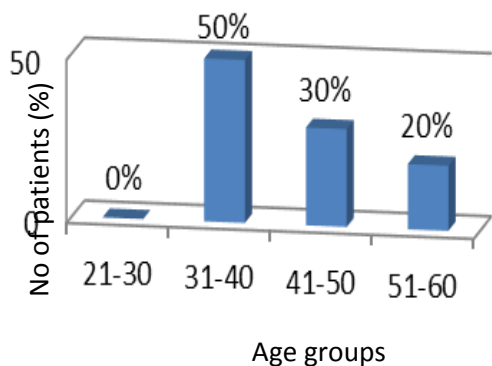


Fig. 1: Bar diagram showing the age distribution of the study patients (n=10)

Most common 8(80.0%) cause of injury was road traffic accident (RTA). Shown in Fig.2

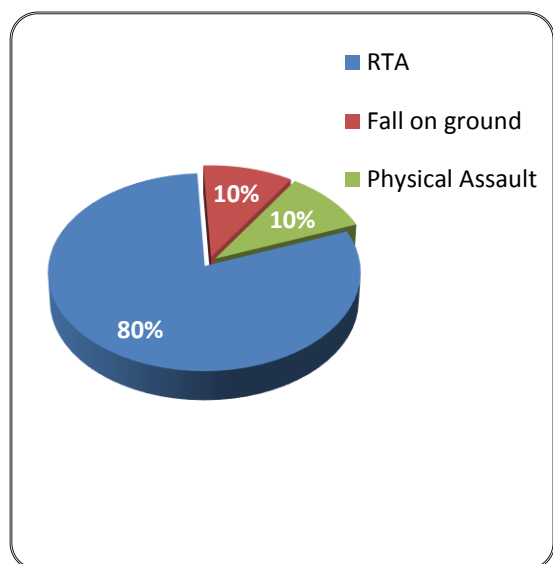


Fig. 2: Pie diagram showing the mechanism of injury of the study patients (n=10)

In our study of 10 distal tibial fractures, maximum 6(60%) patients were AO Muller's Type A3, then 3(30%) patients were AO Muller's Type A2 and another one patient (10%) was AO Muller's Type A1. (Shown in tab. I). Only 1(10%) AO Muller's A3 type fracture was associated with concomitant fibula fracture. Fracture side distribution was equal for both left and right.

Tab. I: Distribution of the study patients by type of fracture (n=10)

Type of fracture	Frequency	Percentage
AO Muller's A1	1	10.0
AO Muller's A2	3	30.0
AO Muller's A3	6	60.0
Total	10	100.0

Among the 10 distal tibial fractures, maximum 8(80%) patients had grade 0 soft tissue injury, and 2(20%) patients had grade 1 soft tissue injury. Shown in Tab. II

Tab. II: Distribution of the study patients by grade of soft tissue injury (n=10)

Tscherne's Grade	Frequency	(%)
Grade 0	8	80.0
Grade 1	2	20.0
Total	10	100.0

**Follow-up of the of the study patients:** Fig. 3 shows the pain status of the study patients, 2(20.0%) patients complaint of intermittent pain during the postoperative follow-up period.

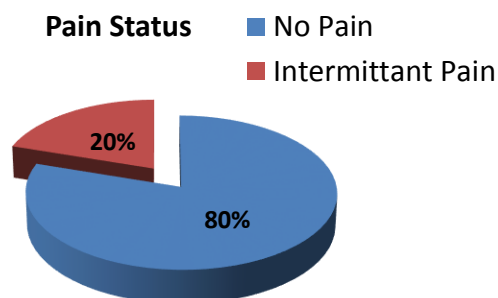


Fig 3: Pie diagram showing pain status

Most of the fractures 6(60%) were united between 12-14 weeks. Mean duration of radiological union was  $14.8 \pm 2.32$  weeks. There was no delayed or nonunion. Maximum 6(60%) patients full weight bear at

time 14-16 weeks (Shown in Tab. III). Mean full weight bearing time  $16.6 \pm 2.31$  weeks.

Tab. III: Radiological union and full weight bearing in patients in different follow-up periods

Follow-up (weeks)	Radiological union	achieved full weight bearing
12-14 wk	6	--
14-16 wk	2	6
16-18 wk	2	2
18-20 wk	--	2
Total	10	10

Tab. IV showing the range of motion, maximum 5(50%) patients had ankle dorsiflexion 10 degree. And 3(30%) patients had 5 degree of ankle dorsiflexion then 2(20%) patients had no dorsiflexion. Mean ankle dorsiflexion was  $6.5 \pm 4.11$  degree.

Tab. IV: Ankle Dorsiflexion (n=10)

Ankle dorsiflexion	Frequency	%
0 degree	2	20.0
5 degree	3	30.0
10 degree	5	50.0
Total	10	100.0

Out of 10 patients, 2(20%) patients had limb length shortening <0.5 cm and in 2(20%) patients had only 5-degree valgus mal-alignment. The remaining patients had no such issues. Shown in Tab. V

Tab. V: Other followup parameters (n=10)

Followup parameters	Frequency	%
Limb length discrepancy (0-0.5 cm)	2	20
Valgus mal-alignment ( $\leq 5$ degree)	2	20

1(10%) patient had ankle stiffness, 1(10%) patients had Superficial surgical site infection

and rest of the patients 8(80%) had no complications. shown in Tab. VI

Tab. VI: Complications (n=10)

Complications	Frequency	%
Surgical site infection	1	10
Ankle stiffness	1	10
No complications	8	80
Total	10	100

Tab. VII showing functional results assessed by Olerud and Mulendar criteria, 3(30%) patients had excellent outcome, 5(50%) patients had good outcome and 2(20%) patients had fair outcome.

Tab. VII: Functional result assessment by Olerud and Molendar Scoring (n=10)

Olerud and Molendar Grading	Freq.	%
Excellent (91-100)	3	30
Good (61-90)	5	50
Fair (31-60)	2	20
Total	10	100







Note: According to Olerud and Molendar Grading (1984), excellent and good outcome are considered as satisfactory & fair and poor outcome are considered as unsatisfactory. Satisfactory = Excellent + Good = 3 + 5 = 8 = 80% and Unsatisfactory = Fair + Poor = 2 + 0 = 2 = 20 %


**Final outcome:** Most of the patients 8(80%) were satisfactory and rest of them 2(20%) patients were unsatisfactory. Tab. VIII showing this.

Tab. VIII: Distribution of the results according to the final outcomes (n=10)

Results	FRQ	%
Satisfactory (Excellent & Good)	8	80%
Unsatisfactory (Fair & Poor)	2	20%
Total	10	100%

In this study, 60% to 100% satisfactory result found by 95% Confidence Interval.

Illustrations of Case No-1:	
	
Picture 1: Placement of locking plate by MIPO technique.	Picture 2: Fluoroscopic view of correct placement of locking plate and screws.
	
Picture 3: Pre-Operative photograph	Picture 4: 12 weeks after Operation
	
Picture 5: 16 weeks after operation. The patient can stand and walk without aids.	Picture 6: 16 weeks after operation. The patient can sit with extended knee and dorsiflex foot.

Illustrations of Case No-2:	
	
Picture 7: Preoperative photograph	Picture 8: 6 weeks after operation
	
Picture 9: The patient can stand 16 weeks after operation.	Picture 10: 16 weeks after operation. The patient can sit and fully plantarflex and dorsiflex foot.

**DISCUSSION**

Distal tibial fractures remain one of the most substantial therapeutic challenges that confront the orthopedic surgeon. Among the different modalities of treatment for distal tibial fractures, MIPO is technically feasible and advantageous in that it minimizes soft tissue compromise and devascularization of the fracture fragments. Locking plate provide stable fixation in distal tibial fractures. Fracture healing is not hampered as there is minimum disturbance of the fracture site. Respect to the soft tissue by indirect reduction and MIPO technique during

operation & early mobilization due to stable fixation improve final outcome.

In our study most of the patients was in age group of 20-40 years (70%) with mean age of 36 years. Road traffic accidents were found to be the commonest mode of trauma (65%). Right lower limb was involved more often (60%) than the left.<sup>7</sup> In this study most of the patients are in age group 31-40 years (50%) with mean age of 41.8 years. And also, road traffic accidents are found to be the commonest mode of trauma (80%). But involvements of both lower limbs are same (50%).

The average operative time was 86.23 min with a range of 70-123 min. The majority of the fractures were operated within 100 min of operative time (90.0%).<sup>6</sup> In this study most of the patient's 6(60%) operated time was 61-90 minutes followed by  $\leq 60$  minutes 4(40.0%). Mean operative time was  $68.0 \pm 12.29$  minutes.

The mean time for radiological union was 21.4 weeks with a range of 16-32 weeks. Only 10% patient developed superficial infections.<sup>6</sup> In this study most of the fractures 6(60%) were united between 12-14 weeks. Mean duration of radiological union was  $14.8 \pm 2.32$  weeks. And also 1(10%) patient developed superficial surgical site infection whose soft tissue Tscherne's grade was 1 and that was managed by empirical oral antibiotics, 1(10%) patient developed ankle stiffness due to lack of proper physiotherapy and also for noncompliance.

Patients could not bear the full weight bearing after 10-12 weeks. No varus deformity was seen after or during weight bearing (Samal et al., 2014). In this study maximum 6(60%) patients beard full weight at time 14-16 weeks. Mean full weight bearing time  $16.6 \pm 2.31$  weeks. No varus deformity was seen but only 2(20%) patients developed valgus deformity (only 5degree) which was happened

during reduction of fracture. In this study 8(80%) patients had no leg length discrepancy, but 2(20%) patients had leg length discrepancy less than 5mm due to comminution of fracture fragments.

Despite the theoretic advantages associated with minimally invasive plating, several studies have reported the rate of delayed union or nonunion for distal tibial fractures with the MIPO technique to be 5% to 17%. But they found there were no nonunions, malunions, or hardware failures, and all patients achieved satisfactory or excellent results. Another study Paluvadi et al. reported 95.06 % excellent result. In this study no patient developed delayed or nonunion and 80% patients had satisfactory result but 20% had unsatisfactory results.

The locking compression plate (LCP) is part of a new plate generation requiring an adapted surgical technique and new thinking about commonly used concepts of internal fixation using plates. Understanding of the mechanical background for choosing the proper implant length and the type and number of screws is essential to obtain a sound fixation.

#### **CONCLUSION:**

Our study showed MIPO with precontoured distal tibial locking plate for extraarticular distal tibial fracture (AO type 43-A) good results in majority of cases. Our limitation is that the sample size is no large enough. 80% of cases return to the routine pre- injury activities without limitations. In terms of subjective evaluation most of the patients had well to excellent outcome. We had 20% unsatisfactory results. But if this technique is practiced more and surgeons become familiar with the technique, we shall have more percentage of satisfactory result. So, we recommend MIPO using precontoured

distal tibial locking plate for extraarticular distal tibial fracture.

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Original Article

**Correlation of Axial Length and Anterior Chamber Depth of Eye: A Study in a Public Medical College Hospital**

Jewell Ilias Rab<sup>1</sup>, Barna<sup>2</sup>, Md. Ashiqur Rahman Akanda<sup>3</sup>, Debabrata Paul<sup>4</sup>

**ABSTRACT**

**Background:** The axial length (AL) is the distance from the corneal surface to an interference peak corresponding to the retinal pigment epithelium/Bruch's membrane. To find out the relationship of AL and anterior chamber depth (ACD) of eye and also to see the variations of these parameters in local population.

**Methods:** It was a cross sectional study of 100 patients admitted at Sher-E-Bangla Medical College and Hospital, Barishal for cataract surgery with IOL implantation, between January 2021 and June 2021. Clinical data included axial length, anterior chamber depth, slit lamp evaluation were recorded. For the purpose of recording, a proforma was prepared containing patients name, age, sex, occupation, address, AL and ACD.

**Results:** In normal AL group mean AL was 22.74±0.47 mm and mean ACD was 2.94 ±0.34 mm. In the short AL group mean AL was 21.42±0.44 mm and mean ACD was 2.17±0.42 mm. In the long AL group mean AL was 24.47±0.46 mm and mean ACD was 3.61±0.36 mm. Based on AL normal AL group had 67 patients (67%); the short AL group had 30 patients (30%) and in the long AL group was 3 patients (3%).

**Conclusion:** In our study mean AL of all the patients was about 23 mm and mean ACD was 3 mm. We found that mean AL in male is more than in female.

**Keywords:** Anterior chamber depth, Axial length, Normal eyes, Short eyes, Long eyes

**INTRODUCTION**

The axial length (AL) is the distance from the corneal surface to an interference peak corresponding to the retinal pigment epithelium/Bruch's membrane.<sup>1,2</sup> The large scale studies on the growth of the ocular components suggest that the eye has reached its adult emmetropic axial length by the age of 13 years and the anterior chamber has normally reached its maximum depth by the age of 15 years.<sup>3</sup> The mean adult values for axial length (AL) are 22-25 mm and mean depth of the anterior chamber (ACD) in an adult emmetropic eye is 3-4 mm.

It is established historically that there is a positive relationship between AL and ACD.<sup>4</sup> This relationship is followed only in normal

to long eyes, which is shown in some recent studies.<sup>5-7</sup> There has been no relationship between AL and ACD when AL was beyond 27 mm was first reported by Hosny.<sup>8</sup> And then it was needed to be proven by studies in large sample size, which was later done by Hoffman and Hutz.<sup>5</sup>

Different studies point out that both heredity and the environment contribute to the refractive power of the eye. It has been shown in several studies that the newborn and infants exhibit considerable refractive errors which are decreased by emmetropisation process when the child grows older.

It has been proven that basic anatomical

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parameters such as AL and ACD are variable in different countries according to ethnic groups, genetics and some environmental factors.

**METHODS**

This cross-sectional was conducted at the Eye department of Sher-E-Bangla Medical College & Hospital, Barishal, after the approval of the ethics committee. Study period was from January 2021 to June 2021. Study population was patients presenting for cataract surgery with IOL implantation. All the patients between 21 to 90 years was included, patients with history of glaucoma, ocular surgery, uveitis, ocular trauma, corneal ulcer or the presence of posterior staphyloma were excluded. Total 100 patients were taken. Simple randomization was done with equal number of male & female. The patients were divided into 3 groups according to the AL.

Group A- (short AL)  $\leq 22$  mm

Group B- (normal AL)  $> 22$  mm  $< 24.50$ mm

Group C- (long AL)  $\geq 24.50$  mm.

The AL and ACD of each patient were measured using the Nidek Echoscan US-500. The collected data were analyzed with SPSS.

**RESULTS**

In this study out of 100 patients 94 patients were above the age of 40 years shown in Tab. I. Half of our patients were male and half were female.

Tab I : Age distribution

Age group	Male	Female
21-30	1	1
31-40	4	2
41-50	6	11
51-60	16	19
61-70	12	11
71-80	7	5

81-90	4	1
total	50	50

We distribute the genders in different groups based on AL shown in Tab II. In the Normal AL group of 67 patients 36 (53.73%) were male and 31 (46.27%) were female. In the short AL group of 30 patients 13 (43.33%) were male and 17 (56.66%) were female.

Tab II: Gender distribution of the participants in groups based on AL

Sex	Normal group	Short group	Long group
Male	36 (53.73%)	13 (43.33%)	01 (33.33%)
Female	31(46.26%)	17(56.66%)	02 (66.67%)
Total	67 (100%)	30 (100%)	03 (100%)

In the long AL group of 3 patients 1 (33.33%) was male and 2 (66.67%) were female.

Normal AL group mean AL was  $22.74 \pm 0.47$  mm and in the Short AL group mean AL was  $21.42 \pm 0.44$  mm in the Long AL group mean AL was  $24.47 \pm 0.46$  mm shown in tab III.

Tab III: Description of the AL in the different groups

AL	Normal group (67)	Short group (30)	Long group (03)
Mean $\pm$ SD	$22.74 \pm 0.47$	$21.42 \pm 0.44$	$24.47 \pm 0.46$
Range	22.01-23.72	20.53-21.93	24.12-24.77

In this study mean of ACD was 3.13 mm with a standard deviation of 0.36 in Normal ACD in 51 patients, mean was in Low ACD group was 2.72 mm with a standard deviation of 0.46 mm in 06 patients and High ACD group of 43 patients had mean ACD of 3.39 mm with a standard deviation of 0.38 mm. shown in Tab IV

In our study mean AL of all the patients is  $22.87 \pm 0.45$  mm and mean ACD was  $2.91 \pm 0.37$  mm. We also found that mean AL

Tab IV: Description of the ACD in the different groups

ACD	Normal ACD (51)	Low ACD (06)	High ACD (43)
Mean±SD	3.13±0.36	2.72±0.46	3.39±0.38
Range	2.44-3.73	2.1-3.7	2.14-3.93

in male is more than in female with 22.42±0.45 mm in male and 21.87±0.36 mm in female. In our study we found mean ACD in male is slightly more compared to female with in male mean ACD 3.21±0.046 and in female 3.16±0.36 mm.

Tab V Relationship of AL &amp; ACD

	Normal AL	Short AL	Long AL	Total
Normal ACD	29 (43.28%)	21 (70%)	01 (33.33%)	51 (51%)
Low ACD	04 (5.97%)	02 (6.66%)	0 (00%)	06 (6%)
High ACD	34 (50.74%)	07 (23.33%)	02 (66.66%)	43 (43%)
Total	67 (100%)	30 (100%)	03 (100%)	100 (100%)

The relation between AL and ACD was the main goal of this study. Tab V shows this relationship.

We found 51 patients had normal ACD (51%), 6 patients had low ACD (6%) and 43 (43%) patients had high ACD. In our study among Long AL group of 3 patients 01 had normal ACD (33.33%), none had low ACD (00%) and 02 (66.66%) patients had high ACD.

Our finding in the Normal AL group of 67 patients, 29 patients had normal ACD (43.28%), 04 patients had low ACD (5.97%) and 34 patients had high ACD (50.74%). In the Short AL group of 30 patients, 21 patients had normal ACD (70%), 02 had low ACD (6.66%) and 07 patients had High ACD (23.33%).

## DISCUSSION

In a study by Rafik El-Ghazaway in Egypt of 90 eyes of patients presenting for IOL implantation, in the normal eyes group, the mean AL was 23.21±0.48 mm and the mean ACD was 3.13±0.36 mm; in the short AL group, the mean AL was 21.18±0.77 mm and the mean ACD was 2.72±0.46 mm; in the long AL group, the mean AL was 27.15±2.60 mm and the mean ACD was 3.39±0.38 mm.<sup>9</sup> In Indonesia, Titiek Ernawati found the mean AL was 23.81±1.46 mm. In this study, the mean ACD was 3.25±0.70 mm.<sup>10</sup> In another study in Iran by Sedaghat showed the mean(SD) AL was 23.3± 2.35 mm and the mean (SD) ACD was 2.8± 0.48 mm.<sup>11</sup>

Sedaghat found 477 patients had normal ACD (68.3%), 117 patients had high ACD (16.8%) and 104 patients had low ACD (14.9%).<sup>11</sup>

Holladay found that among long AL patients, 90% have normal ACD, 10% have high ACD and none of them have short ACD.<sup>12</sup> In the study by Sedaghat it was 59.8%, 37.9% and 2.3% respectively). So in the high AL group low ACD is less common.

In the group of patients with normal AL, Holladay found that 90% of patients had normal ACD, none of them had low ACD and 10% had high ACD (in study by Sedaghat it was 71.3%, 13.5% and 15.2% respectively).<sup>11</sup> So these studies show patients with normal AL has more normal ACD but our finding was that patient in these group had high ACD.

In patients with short AL Holladay found that 20% have low ACD, 80% have normal ACD and none of them have high ACD (in the study by Sedaghat it was 27.1%, 63.9% and 9% respectively). Our findings differed in these short AL group as high ACD in these group was higher than the other studies, where Holladay found none and Sedaghat found 9% we found 23.33%. The limitations

of this study was the sample size, which is small. Additionally, lens thickness and corneal diameter were not included, which may have affected the AL & ACD.

### CONCLUSION

In our study mean AL of all the patients is  $22.87 \pm 0.45$  mm and mean ACD was  $2.91 \pm 0.37$  mm. We also found that mean AL in male is more than in female with  $22.42 \pm 0.45$  mm in male and  $21.87 \pm 0.36$  mm in female. Based on AL Normal AL group had 67 patients (67%); the short AL group had 30 patients (30%) and in the long AL group was 3 patients (33.33%). So in our study we found that Long AL (03%) and Low ACD (06%) is uncommon in our population. A bigger sample size and use of optical biometry rather than ultrasonic biometry would give better results.

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Original Article

**Fine Needle Aspiration Cytology of Granulomatous Inflammation with Special Attention to Tuberculosis**

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**ABSTRACT**

**Background:** Granulomatous inflammation is a special type of chronic inflammation due to a wide range of etiologic factors involving almost all organs of the body. Newer techniques (like Xpert gene test by polymerase chain reaction) are being developed for diagnosis of granulomatous inflammation and detecting the aetiologic factors with special attention to the commonest cause of tuberculosis.

**Method:** We reviewed slides of 75 cases of granulomatous inflammation diagnosed at cytopathology department of Sher-E-Bangla Medical College and Islami Bank Hospital, Barisal between March 2019 and June 2021. We examined sex, age, site of aspiration, presence of epithelioid histiocytes in scattered and clustered form, other supporting evidence of granulomatous inflammation such as giant cell formation, presence of caseation necrosis, polymorphs, plasma cells, eosinophils, result of Ziehl-Neelsen stain and final cytological diagnosis.

**Results:** Our sample comprised of 27 males and 48 females. Most of the cases (n=20, 26.7%) were between the age of 21 to 30 years. Lymph nodes (n=58,77.3%) were the commonest site of granulomatous inflammation ahead of breast (12), skin (4) and thyroid (1). Scattered epithelioid histiocytes were found in 41 cases (54.7%) while clustered epithelioid histiocytes were found in 32 cases (42.7%) and two cases had no visible epithelioid histiocytes. On the other hand, accessory evidence such as giant cell, caseation necrosis, polymorphs, plasma cells and eosinophils were present in 8 (10.66%), 8 (10.66%), 37 (49.33%), 8 (10.66%) and 5 (6.66%) cases respectively. Eight cases (10.66%) cases were cytologically consistent with tuberculosis while another 8 (10.66%) cases were suggestive of tuberculosis.

**Conclusion:** We should cautiously examine granulomatous inflammation with suspected tuberculosis in addition to other diagnostic tools for tuberculosis.

**Keywords:** FNAC, Granulomatous Inflammation, Tuberculosis

**INTRODUCTION**

Granulomatous inflammation is chronic inflammation characterized by formation of granuloma where aggregation of macrophages transformed into epithelioid histiocytes surrounded by mononuclear lymphocytes and other inflammatory cells are found, sometimes having multinucleated giant cells and central caseation necrosis.<sup>1</sup> The most important cause of granulomatous inflammation in a developing country like Bangladesh is tuberculosis.<sup>2</sup> As the burden of tuberculosis is increasing not only in Bangladesh but also in developed countries.<sup>3</sup> It is becoming more challenging for a cytopathologist to diagnose granulomatous inflammation.

Due to a wide range of aetiological factors including some malignancies like Hodgkin and Non Hodgkin lymphoma and metastatic squamous and adenocarcinoma, sometimes it may become difficult for cytopathologists to diagnose granuloma. Although demonstration of Acid fast bacilli in the specimen by Ziehl-Neelsen stain is confirmatory for diagnosis of mycobacterium tuberculosis, its detection rate is low. Even histopathology cannot confirm diagnosis of tuberculosis without demonstration of acid fast bacilli.

Epithelioid histiocytes is the hallmark of granulomatous inflammation.<sup>4</sup> Only scattered epithelioid histiocyte is sufficient

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to prove granulomatous inflammation. But cytopathologist always search more evidence because a sinus histiocytes, a fibroblast or an endothelial cell can mimic epithelioid histiocytes.<sup>5</sup> Along with scattered epithelioid histiocytes, presence of clustered epithelioid cells, formation of giant cells, caseation necrosis, presence of other cells of chronic inflammation such as plasma cells, eosinophils or abscess are supporting evidence of a granulomatous inflammation.

Because inflammation, repair and tissue destruction coexist at varying degrees in chronic inflammation, presence of endothelial cells as a part of angiogenesis (interleukin), fibroblast as part of fibrous tissue proliferation (interleukin) and sinus histiocytes and other resident histiocytes as component of lymph node and other tissues respectively are almost inevitably present in a granulomatous inflammation.<sup>6</sup>

The above scenario led us to review the granulomatous inflammation reports keeping in mind that tuberculosis might be an important association. So, we reviewed some cases of granulomatous inflammation to assess its association with tuberculosis.

## **METHODS**

We conducted this retrospective study of 75 records of granulomatous inflammation in the department of cytopathology, Sher E Bangla Medical College (SBMC) and Islami Bank Hospital (IBH), Barishal. between March 2019 and June 2021. After approval by the ethical committee of the Institutional review board (IRB) of SBMC, we secured the confidentiality of the data with no disclosure of the information that might be harmful to the patient. We excluded cases other than granulomatous inflammation. FNAC samples were collected from selected patients with all aseptic precaution at department of cytopathology. FNAC sampling was performed with a 21-gauge needle on a syringe with application of

vacuum. FNAC aspirates were immediately smeared in glass slides and fixed in 95% alcohol and were sent to the laboratory for staining. In the laboratory, Hematoxyllin & Eosin staining and Ziehl-Neelsen staining of the slides were done according to the standard protocol followed at SBMC and IBH, Barishal and all the prepared slides were assessed for cytological diagnosis. We did the Hematoxyllin and Eosin staining by a) fixation of the prepared smear in 95% alcohol for >30 minutes, b) air drying of the slides, c) dip into Harris Hematoxyllin for 1-3 minutes, d) rinsing in tap water for 10 minutes, e) dip into 95% alcohol 10 times, f) dip into Eosin Azzure 65 ten times, g) dip into 95% ethanol 10 times, 2 changes, g) dip into 100% ethanol 1 minute h) clearing into 2 changes of xylene 2 minutes, i) permanent mounting with DPX. Steps of Ziehl-Neelsen staining were a) preparation of smear, b) air drying for 30 minutes, c) heat fixed dried smear, d) application of carbol fuschin, e) heat the smear until vapor begins to rise at 60 degree centigrade, f) wash off the stain with clean water, g) application of 20% sulfuric acid as decolorizer, g) wash with clean water. h) counter stain with malachite green, i) wash off with clean water, j) wipe the back of the slide, place it in a draining rack and air dry.

All the samples were collected from database of the department of pathology SBMC and IBH, Barishal in prescribed forma. Then we entered the data in Statistical Packages for Social Sciences (SPSS-17) where the analysis was done. We classified the data according to age, sex and the diagnosis, site of inflammation and other related variables.

The results were presented in tables, where absolute and relative frequency were given. In addition, we also presented figures and pictures of photomicrograph.

**RESULTS**

We recorded 27 males (36.0%) and 48 females (64.0%). When we looked at the age distribution shown in fig. 1.

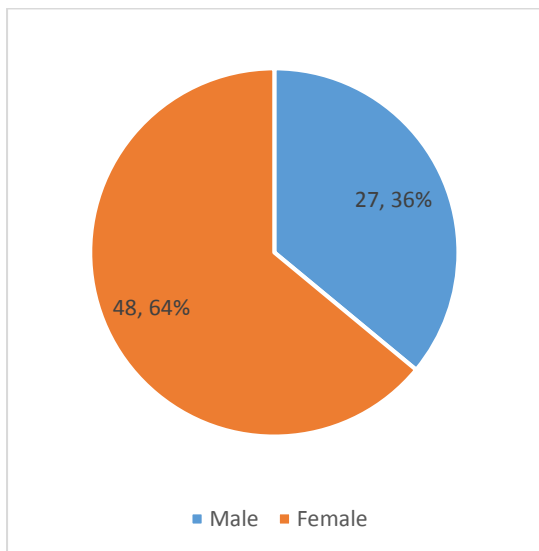
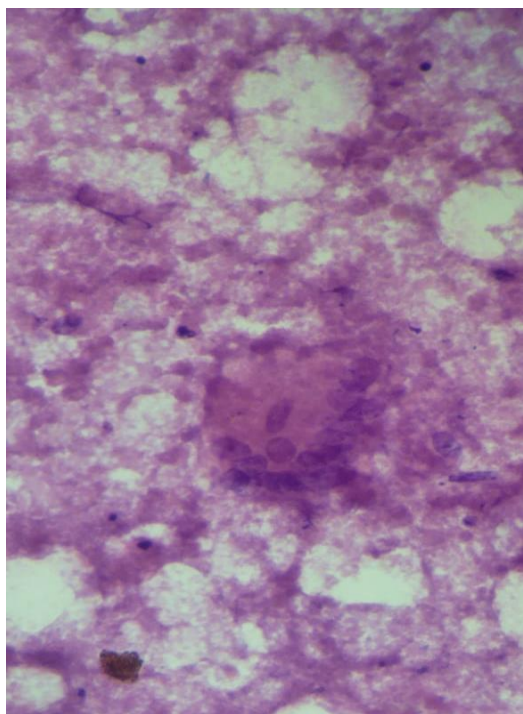
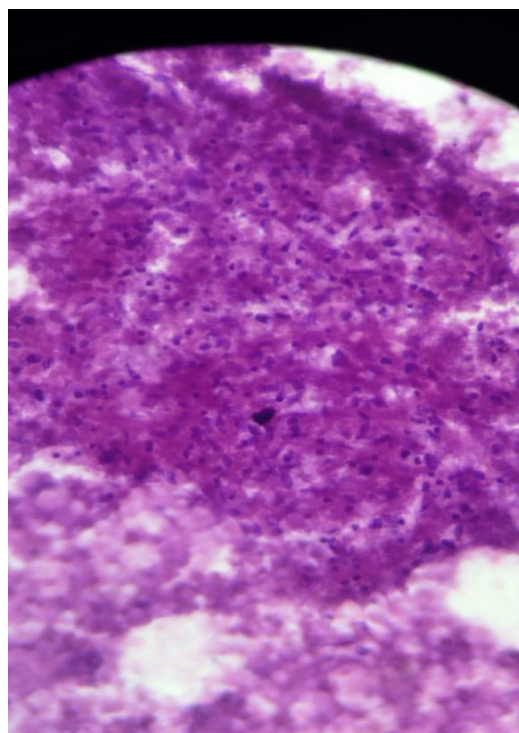


Fig. 1: Pie chart showing gender distribution.

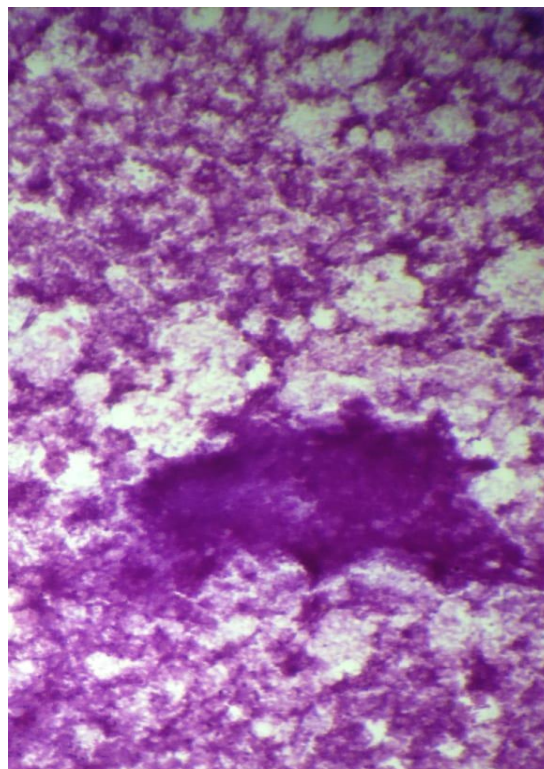
We found the ages of 21 to 30 years to be more prevalent (n=20) shown in fig. 2.



**Pic.1 Photomicrograph showing giant cell**



**Pic.2 Photomicrograph showing scattered and clustered epithelioid histiocytes**



**Pic.3 Photomicrograph showing caseation necrosis**

Only scattered epithelioid histiocytes without any other evidence were found in only 2 cases while along with other findings

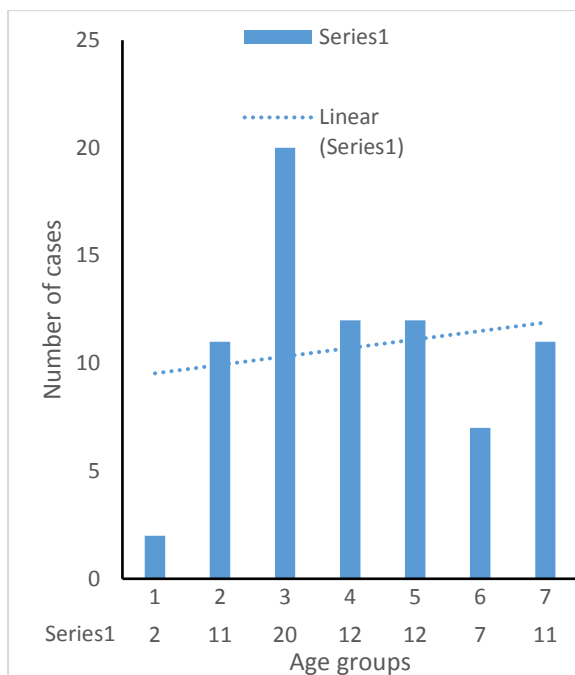


Fig. 2: Bar diagram of age distribution

epithelioid cells were found in 32 cases. Scattered as well as clusters of epithelioid histiocytes were observed in 41 Cases. Caseation necrosis was present in 8 cases. On the other hand, other evidence of granuloma such as giant cells, presence of polymorphs, plasma cells, eosinophils were present in 8, 37, 8, and 5 cases respectively (shown in Fig. 3).

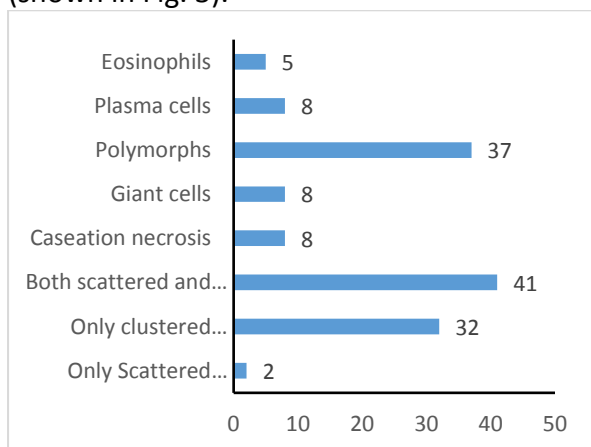


Fig.3 Microscopic Findings of Study Cases

Among the 75 cases, 19 cases were diagnosed as tuberculosis (Acid fast bacilli positive) (25.33%), 4 (5.33%) cases were diagnosed as cytologically consistent with tuberculosis while 8 (10.66%) cases were

diagnosed as suggestive of tuberculosis. All the other cases (44) (58.67%) were recommended for further workup to rule out possibility of tuberculosis (shown in Fig.4).

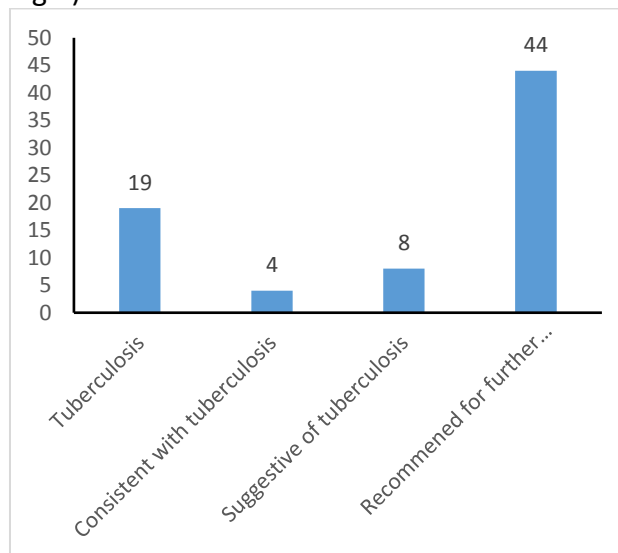


Fig. 4: Distribution of the Study Population According to Diagnosis

Among the 75 cases, 19 (25.33%) cases were found acid fast bacilli positive.

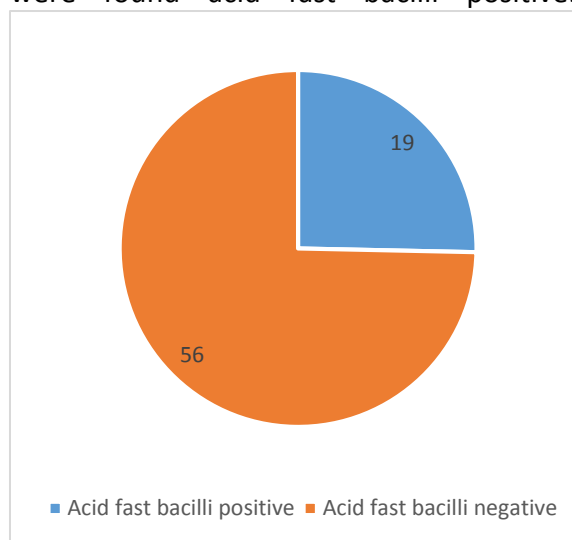


Fig. 5: Distribution of the Study population According to Acid Fast Bacilli Positivity

All the other cases 56 (74.67%) were acid fast bacilli negative shown in fig. 5.

**DISCUSSION**

This study was aimed to evaluate cytologic findings spectrum of granulomatous inflammation. From this study, epithelioid histiocytes both scattered along with

cluster were found in highest number of cases. On the other hand, only scattered epithelioid histiocytes were found in 2 cases only. Ziehl-Neelsen stain was positive in nineteen cases (25.33%). From this study, we understand that only scattered epithelioid histiocytes are not sufficient for diagnosis of granulomatous inflammation, rather we can expect scattered and clustered form of epithelioid histiocytes in majority of the cases. Again, although supporting evidence like multinucleated giant cells, polymorphs, plasma cells, eosinophils and caseation necrosis play an important role in diagnosis of granulomatous inflammation, we may not get these evidences in most of the instances.

In a study by V Koo et al. 14 out of 22 (64%) had their diagnosis confirmed through histological assessment,<sup>7</sup> though we could not go for histology. On the other hand, our study included only FNAC result, rather than histopathology and other sites rather than lymph nodes. Nineteen cases (25.33%) cases were Ziehl-Neelsen positive hence diagnosed as tuberculosis. However, other cases of granulomatous inflammation remained undiagnosed due to absence of histopathological examination of the excised lymph node. Here we observe that a large number of cases will be undiagnosed without the availability of lymph node biopsy.

Again, although histopathology is the gold standard of tissue diagnosis, it cannot confirm diagnosis of tuberculosis without demonstration of mycobacterium tuberculosis bacilli on Ziehl-Neelsen stain. In addition, lymph node biopsy is contraindicated in metastatic cases. Even a small lymph node biopsy may have adverse consequences in patient. Now days, Xpert gene test can confirm the presence of tuberculosis bacilli.

Majeed and Bukhari examined 100 cervical lymph node enlargement cases in Lahore,

where 78% cases were below 30 years of age. Mean age was  $25.14 \pm 12.75$  years.<sup>8</sup> We encountered age of 21 to 30 years to be highest (n=20, 26.7%) in our study. As females are more prone to develop granulomatous inflammation due to poor nutritional status, our study reported the fact by giving 68% females to be affected more than males. In our study among the 75 cases diagnosed as granulomatous inflammation, 27 were male and 48 (64%) were female. Majeed and Bukhari found 44 out of 100 patients of granulomatous inflammation were positive for AFB. In our study, among the 75 cases, 19 (25.33%) cases were found Ziehl-Neelsen stain positive. All the other cases 56 (74.67%) were Ziehl-Neelsen stain negative. Our study yielded similar results except positivity of acid fast bacilli. Only 19 cases (25.33%) were positive for Ziehl-Neelsen stain. Due to inclusion of other sites rather than cervical lymph nodes and possibility of wide range of etiologies other than tuberculosis, our study showed different result in acid fast bacilli positivity.

*Limitations:* FNAC cannot confirm the diagnosis of granuloma from wide range of etiologies. It can only be used as a screening tool for granulomatous inflammation as it is simple, cheap, safe and quick. We could not confirm the diagnosis by relating with our cytopathology finding hence leaving an important limitation of this study.

## CONCLUSION

Our study revealed around 21% of granulomatous inflammation suspected for tuberculosis. Though granulomatous inflammation does not necessarily indicate the presence of tuberculosis as it is difficult for both clinicians and pathologists, we should correlate the finding with other ancillary tests like ESR, tuberculin test, sputum for AFB and Gene Xpert test. An online data registry system between clinical and pathology department can be used to

follow up the treatment outcome hence confirm the diagnosis of these cases.

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## Case Report

### Pregnancy Associated with Parts of Small Intestine within Uterine Cavity

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#### ABSTRACT

Pregnancy usually held within uterine cavity in fully developed endometrium. Presence of foreign body, large polyp, intrauterine adhesion may impair implantation. Pregnancy associated with parts of small intestine within uterine cavity and continuation of pregnancy up to full term is very difficult and complex process. To our knowledge this is the first case reported in the literature. It was diagnosed incidentally during the process of emergency cesarean section. The patient added history of trial of induced abortion at 8 weeks period by unskilled practitioner, which was unsuccessful. Emergency cesarean section was done due to fetal and maternal distress. After delivery of the baby parts of small intestine had found entered through a small fundal opening into the uterine cavity. Adhesion of the intestine in the uterine cavity at level of internal os and it was buried deeply in the myometrium. Separation of the intestine, repair of myometrium and control of post-partum haemorrhage was challenging.

**Keywords:** Pregnancy associated small intestine, Intestine and gravid uterus.

#### INTRODUCTION

Perforation of uterus is life threatening condition to a woman. Usually this perforation is observed in case of induced abortion. Induced abortion is an essential component of comprehensive reproductive healthcare. An estimated 56 million abortions are undertaken worldwide<sup>1</sup> and, in Britain one in three women will terminate a pregnancy<sup>2</sup>. Worldwide an estimated 6.9 million women are treated for complications of unsafe abortion each year and up to 40,000 die<sup>3</sup>. With dilatation and curettage perforation occurs 2-3 per 1000 procedures. A history of two or more cesarean section deliveries is the strongest predictor of a major complication with dilatation and evacuations<sup>4</sup>. Continuation of pregnancy occurs in fewer than 1 in 1000 procedures performed at 12 weeks gestation or less but higher with uterine anomalies, multiparity,

very early gestational age or when performed by a less experienced surgeon.

Perforation of uterus and injury to small gut may cause active bleeding, haemorrhagic instability, peritonitis, acute abdomen. Laparotomy or laparoscopy is the ultimate management. Intestinal injury involving serous or muscular layer with intact mucosa can occur. Traction of intestine with sponge holding forceps through wound of perforated uterus, may cause difficulty to return back even can cause strangulation of the folded intestine. Abrasion on serous surface of trapped small gut may help to adhere on raw uterine musculature. Healthy intestine may not be adherent with muscles at fundal opening. So continuation of peristaltic function through trapped intestine and also growth of pregnant sac simultaneously in the uterine cavity is possible.

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## CASE REPORT

The patient age of 35 years, height 150 cm, weight 49 kg, para 4, gravida 5, age of last child 10 years; admitted through Emergency department in labour ward on 06/01/2021 at her 36<sup>th</sup> weeks of pregnancy; with the complaints of per vaginal watery discharge for 2 days and history of continuation of pregnancy following induced abortion at her 12 weeks of pregnancy.



Picture. 1: Adherent intestine at posterior wall of the uterus



Picture 2: Small intestine with mesentery entered through uterine fundus

Quick examination of the patient was done. She was mildly anaemic, anxious looking, malnourished, mildly dehydrate and blood pressure normal, fundal height was 34 weeks

size and absent liquor, cervix was 1.5cm dilated. Fetal distress was diagnosed.

Emergency cesarean section had done; a healthy female baby 2.5 kg with average for gestational age found. After delivery of placenta, uterus exterior done. Parts of small intestine with mesentery had entered through a circular hole at the uterine fundus into the cavity. Intestine found deeply implanted within myometrium at the posterior wall at level of histological internal os. Intestine was separated cautiously keeping intact by cutting adjoining myometrium. Uterus was closed as usual. There was a clean healthy circular wound about 3cm in diameter and closed by continuous suture.

Surgeon examined the intestine and other structures, all layers of intestine was intact. Patient was kept on intravenous saline and parenteral antibiotics for 3 days without any oral medication.

## DISCUSSION

Although some planned pregnancies end in abortion, most women who have abortions did not intended to become pregnant. In the third National Survey of Sexual Attitudes and Lifestyles, 57% of unplanned pregnancies ended in abortion compared with 33% categorized as ambivalent and 10% as planned<sup>5</sup>. Unplanned pregnancy results from failures of contraception in some cases, but many occur because no contraception was used or because the method was used inconsistently or incorrectly<sup>6</sup>

Women of low socioeconomic family with late reproductive age and high parity usually did not use contraception properly, many of them become pregnant. May hide to family members and unsafe abortion done and suffers from various complications, even death. Perforation of uterus and excessive haemorrhage, injury to intestine is common.

When mishap happen both patient and service provider tries to hide family members and suffer various complications. In cases of uterine fundal perforation, sudden stoppage bleeding by pressure effect of impacted intestine is possible. Abrasion of intestinal serous layer and adherent with rough myometrial surface is also possible and held in this case.

Proper identification of pathology, dissection from uterine myometrium, observation of intestinal viability and integrity and prevention of intestinal obstruction is vital.

### **CONCLUSION**

Proper practice of contraception up to menopause should be practiced perfectly. In case of such complicated pregnancy management with skill hands can prevent different types of mishap.

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