

A PROSPECTIVE STUDY OF FUNCTIONAL
OUTCOME OF OPEN REDUCTION AND
INTERNAL FIXATION OF PEVIS AND
ANTERIOR ACETABULAR FRACTURE
TREATED THROUGH MODIFIED STOPPA
APPROACH

By

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in

ORTHOPAEDICS

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ABSTRACT

“A PROSPECTIVE STUDY OF FUNCTIONAL OUTCOME OF OPEN REDUCTION AND INTERNAL FIXATION OF PELVIS AND ANTERIOR ACETABULAR FRACTURE TREATED THROUGH MODIFIED STOPPA APPROACH”

INTRODUCTION:

Acetabular fractures are becoming more common these days as a result of poor driving safety. Road traffic collisions are the primary cause of injuries. Simple acetabular fracture therapy is well recognised and extensively researched. Treatment for complicated acetabular fractures is challenging because it necessitates prolonged exposure and makes it challenging to decrease the walls and columns in a single procedure.

Since the Stoppa approach was devised, It now serves as a substitute for the conventional ilioinguinal strategy.

AIM:

The objective of the study is to assess the functional result of fractures of the pelvis and the acetabulum that were treated using a Modified Stoppa method.

MATERIALS AND METHODS:

A total of 30 patients, with acetabular fracture were included. We investigated the clinical outcomes of treating an acetabular fracture using a modified Rives-Stoppa technique. Due to the neurovascular window and the absence of an inguinal canal rupture, this method has less downsides. Results were utilised using Score for Merle D' Aubigne.

RESULTS:

Out of the 30 cases we examined, had a fantastic outcome Maximum cases 16 cases showed good outcome, 10 cases had excellent outcome followed by 2 cases with fair outcome and 2 cases with poor outcome. We achieved statistically significant correlation between the outcome and radiographical results post surgery (p value-0.0001).

CONCLUSION:

The use of non-extensive techniques has simplified surgery and decreased complications. With greater surgical skill and early surgical intervention, we can treat difficult acetabular fractures using this innovative technique for anterior exposure of the acetabulum.

Keywords : Acetabulum, Rives – Stoppa, Merle D' Aubigne

Introduction

With the rapid development of industry, transportation, and shipping, pelvic and acetabular fractures have significantly increased. Acetabular fracture of the Anterior wall, which is displaced, should be reduced surgically to ensure a painless, mobile, and stable hip.¹

Displaced acetabular fractures can lead to the early onset of hip osteoarthritis if ignored.²

Open reduction and rigid internal fixation would result in better outcomes than conventional therapy. ³ Since then, surgical treatment of these fractures has been the norm.⁴

The last 20 years have seen advancements in prehospital care, vehicle safety, and established protocols for treatment, as well as care, resuscitation, and transport have all helped increase survival rates following the severe pelvic injuries.

The acetabulum is only involved in 10% of the disturbances of the pelvis. The main factor in High-energy trauma is experienced by younger people. Typically, acetabular fractures occur in addition to other fractures, Rives – Stoppa, Merle D' Aubigne

In the field of orthopaedics, treating acetabular fractures is a challenging procedure that requires Orthopaedics is a complex field that is constantly improving, and treating acetabular fractures is one of those areas. A clear learning curve that is continuously improved is required.

Acetabular fractures are frequently accompanied by other pelvic and/or lower limb injuries, which may have an impact on the available treatments, the surgical technique, and the clinical results. The patient's age, the stability of the fracture, the presence of two comorbid conditions, osteoporosis, and the surgeon's expertise all affect the treatment options.

Anatomic rebuilding of the articular surface and early mobilisation should be the treatment's objectives. When the acetabulum is exposed and rigid internal fixation is performed, this goal can be achieved. Ilioinguinal, extended iliofemoral, triradiate surgical techniques, or combinations of them, are frequently employed for operative management through an anterior route.

The ilioinguinal approach has been in use for fracture exposure and reduction. As many defects resulting from severe trauma, limited space for fixation, and reduction and complicated anatomy, a better approach was needed.¹

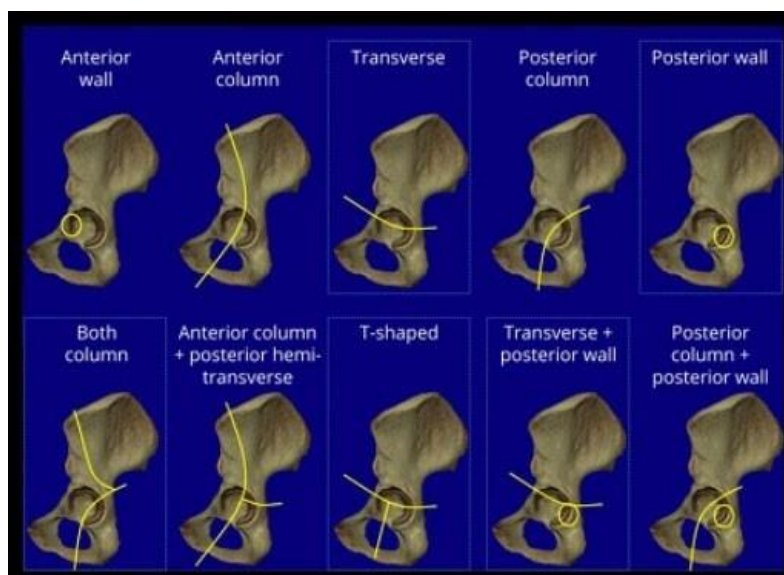
Treatment for displaced acetabular fractures of the pelvis is challenging. It is challenging, Using closed procedures, It is difficult to completely restore the articular surfaces or to achieve adequate stability for early hip motion, if not impossible.

Simple acetabular fracture therapy is well recognised and extensively researched. Treatment for complicated acetabular fractures is challenging because it necessitates prolonged exposure and makes it challenging to decrease the walls and columns in a single procedure.

Since the Stoppa approach was devised, It now serves as a substitute for the conventional ilioinguinal strategy. The Modified STOPPA method was initially applied to a hernia.^{5,6} Later on, as the requirement for acetabular fracture was in need, it served the purpose. It has the advantages of direct visualization and being less invasive.^{5,6,7,8}

In order to treat acetabular fractures that need anterior fixation using the modified Rives-Stoppa method, open reduction and internal fixation procedures were employed in this study. The goal was to assess the functional outcomes of these treatments.

According to Judet and Letournal, there are several different types of acetabular fractures.⁹



AIM OF THE STUDY

The objective of the study is to assess the functional result of fractures of the pelvis and the acetabulum that were treated using a Modified Stoppa method.

Review of literature

This injury used to be rather uncommon. Early accounts of acetabular fractures were based on post mortem results of patients who had experienced substantial trauma, indicating the severity of these injuries.¹⁰

In 1821, Cooper first in-depth description of an acetabular fracture. The post mortem findings of a patient who also had a central femoral head dislocation into the pelvis were given in this instance.

In 1909, The first 49 cases that were mentioned in the literature were thoroughly collected by Schroeder and published. The majority of them describe autopsy results in individuals who died as a result of hemorrhagic shock complications or the gradual emergence of intraabdominal infections.

In 1911, Skillern also noted four further instances of acetabulum "floor" fractures. fractures that occur anteriorly or posteriorly through the cotyloid and acetabulum fossa below the roof , are referred to in early literature as fractures of the acetabulum floor.

There was little consistency in the terminology, classification, description, and treatment of these injuries for the majority of the 20th century. MacGuire talked about using a threaded pin that was percutaneously placed into the proximal femur for lateral traction and therapy in 1926. A three-month period of immobilisation was recommended at the time.

Campbell In 1936, he conducted a study on the use of acetabular fractures in the treatment of posterior hip dislocation. Observed that acetabular fracture was relatively common with hip joint dislocation.⁹

Levine described the initial, successful outcomes of ORIF for an acetabulum central fracture in the early 1940s.

In 1962, In a study conducted by Brav, 264 of the 523 patients who had fracture dislocations and hip joint dislocations were monitored for a total of two years.

In 1964, The now-classic study "Fractures of the Acetabulum, Classification and Surgical Approaches for Open Reduction" by Judet et al. was published. In this research, the acetabular fractures are evaluated by the Anteroposterior and two forty five* oblique views of the pelvis bone. The radiographic views of the anterior-posterior pelvis, the obturator view, and the iliac oblique view are now known as "Judet" views in honour of the originator. These radiographic films are currently the norm for evaluating acetabular fractures. The knowledge of acetabular anatomy and fracture categories advanced significantly as a result of this article.

In 1984, In Paris , Letournel gave his first-ever international lecture on how to treat pelvic and acetabular fractures.

In 1986, Matta contributed to the development of the nonoperative approach to treating acetabular fractures by publishing two studies. Anteroposterior and the forty five * oblique Judet images of the pelvis, Matta came up with the idea of a "roof arc measurement " .

Letournel supported a course of treatment for acetabular fractures that involves meticulously studying radiograph to understand the fracture type and then correctly classifying the fracture , followed, whenever possible, by appropriate patient positioning during surgery to operate on the fracture. Getting an anatomic decrease of the articular surface has been prioritised. The clinical result will be better the more precise the articular reduction , according to long-term clinical outcome data.

For some kinds of acetabular fractures, some writers have promoted regimens using various techniques, either concurrently or sequentially.

In 1990s, Cole and Hirvensalo developed a method for dissecting the pelvis and anterior column through a midline intrapelvic dissection that they separately found. It was a modified version of Rives and Stoppa's method for treating bilateral inguinal hernias.

In 2015 **Mehmet el Mada, Yunus guzel, Yusuf Aksoy, Mehmet arazi**, A retrospective analysis of 36 patients (25 men and 11 women; an average age of 44 years) who underwent treatment for displaced acetabular fractures with a modified Stoppa technique was done. According to the Judet and Letournel classification of acetabular fracture, Two columns, eight anterior columns with posterior Hemi transverse, six transverse, and two t-type fractures are among the number of anterior columns involved. Assessments included motion range, Merle d'Aubigne, and Harris hip scores. Axial, coronal, and sagittal computed tomography (ct) image displacements and differences, as well as post-reduction accuracy, were measured before and after surgery. The average follow-up period was 14.7 months. The average amount of postoperative bleeding was 970 ccs. The mean Merle D'Aubigne hip score was 16.4, 77.9 was the average Harris hip score, 105.2 was the average flexion, and 16.9 was the average extension. In 29(80.5 percent) patients, anatomical reduction in acetabular fracture was achieved; in 5(13.8), it was satisfactory, and in 2, it was low (5 percent). Mean pre-operative displacements were 4.1, 3.6, and 3.1 mm respectively on the axial, coronal, and sagittal sections, and mean postoperative displacement were, respectively, 0.2, 0.3, and 0.2 mm. The average gap size was 14.5 mm before surgery, and it was 1.1 mm thereafter. Two patients experienced post-operative foot drop, one experienced obturator nerve injury, another experienced partial iliac vein damage, and 1.8 patients experienced avascular femoral head necrosis.²

In 2015 **Hesham Mohamed Safwat Ibrahim** A modified Stoppa approach was used to treat 22 patients with acetabular fractures. The patients' average age at the conclusion of the two-year follow-up period was 45, with 16 men and 6 women among them. Clinical outcomes were excellent in three instances, good in thirteen, and poor in two, whereas radiographic outcomes were excellent in five patients, good in thirteen cases, and poor in two. The radiological results were not statistically significant ($p=0.74$), but the clinical outcomes based on the standard of reduction and the level of communication were ($p=0.03$ and $p=0.04$, respectively).¹¹

In 2018 **Cem Yalin Kilinc, Ahmet Emrah Acan, Emre Gultac, Rabia Mihriban Kilinc, Onur Hapa, Nevres Hurriyet Aydogan** Between 2013 and June 2016, 57 patients treated for an acetabulum fracture utilising a modified Stoppa technique were counted in the study. The typical follow-up period was 28.1 months. With HHS and Merle d'Aubignè ratings of excellent in 27 patients, good in 23, fair in 4, poor in 3 patients, and 16.7 at the end of follow-up, clinical results at two years were on average 86.6 (range 66-96). (range 10-18) Very good in 25, excellent in 18, good in 6, mediocre in 5, and poor in 3 patients. Although there was a significantly favourable correlation between reduction quality and clinical outcome, there was no significant correlation between clinical outcome and fracture type ($p>0.05$) ($P 0.001$). Two cases involved iatrogenic injury to the external iliac vein. Three persons were found to have obturator nerve palsy, but after 3.7 months, they all made a full recovery.¹²

In 2018 **Diederik O. Verbreek, Kornelis J., Ponsen, Mark vanHeijl, J.Carel Goslings**

The Stoppa technique was used to surgically fixate 47 fractures in 45 patients. One patient had a vascular lesion that required surgical intervention during the operation, and three other patients had diffuse bleeding and two wound infections. A mean of 59 months (SD 49) after surgery, 29 out of 39 (74%) native hips were still functioning. The rate of follow-up was 83%. Excellent-good functional scores were obtained by 88% (merle d'Aubigne) and 76% of patients who kept their natural hip (harris hip). Six of the eight short form 36 indices in these patients were frequently consistent with community norms. 29 native hips with radiographic follow-up (mean

59 months, SD49) had four (86%) abnormality-free hips.¹³

In 2019 **Ahmed Saleh Al Adawy, Abdel Hamid Abdel Aziz, Faisal Ahmed El Sherief, Wael Shaban Mahmoud, Mahmoud Mabrook, and Yaser EL-Sayed Hassan** completed a clinical trial that was randomised controlled in order to update the modified Stoppa method. In the years between 2015 and 2017, the classical fractures method was used to treat 18 patients with acetabular fractures.

A clinical case group of 20 patients with acetabular fractures underwent surgery between 2017 and 2019 utilising the modified Stoppa method, and a control group of 20 patients underwent ilioinguinal surgery and had their medical records retrospectively examined. 25 men made up the entire study, and their average age ranged from 18 to 65 years. Five patients were unfollowed over the 18.5-month median follow-up period. 75% of patients who received modified had excellent clinical outcome scores at the end of the follow-up period.¹⁴

In 2019 **Hong-Zhang Guo, Yu-fang He, Wan -Qing He** treated 18 patients with pelvic ring fractures and acetabular anterior column fractures using a modified Stoppa method. After surgery, the patients were monitored for 12 to 36 months. At the final check-up, 12 issues had undergone anatomical changes, while the remaining cases had undergone satisfactory changes. The Majeed criteria determined that 13 patients were exceptional and 5 patients were good.¹

Applied anatomy

The acetabulum cavity is created by the central union of the 3 bones, namely ilium, ischium, and pubis. It helps the surgeon to create anterior and posterior columns within the acetabulum and innominate bone.

In the anterior column, there are

Anterior border of the iliac wing,

Pelvic brim,

Anterior wall of the acetabulum,

and Superior pubic ramus

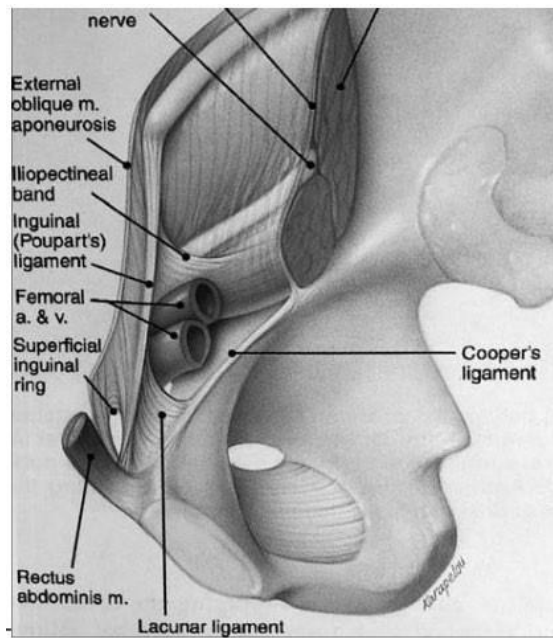
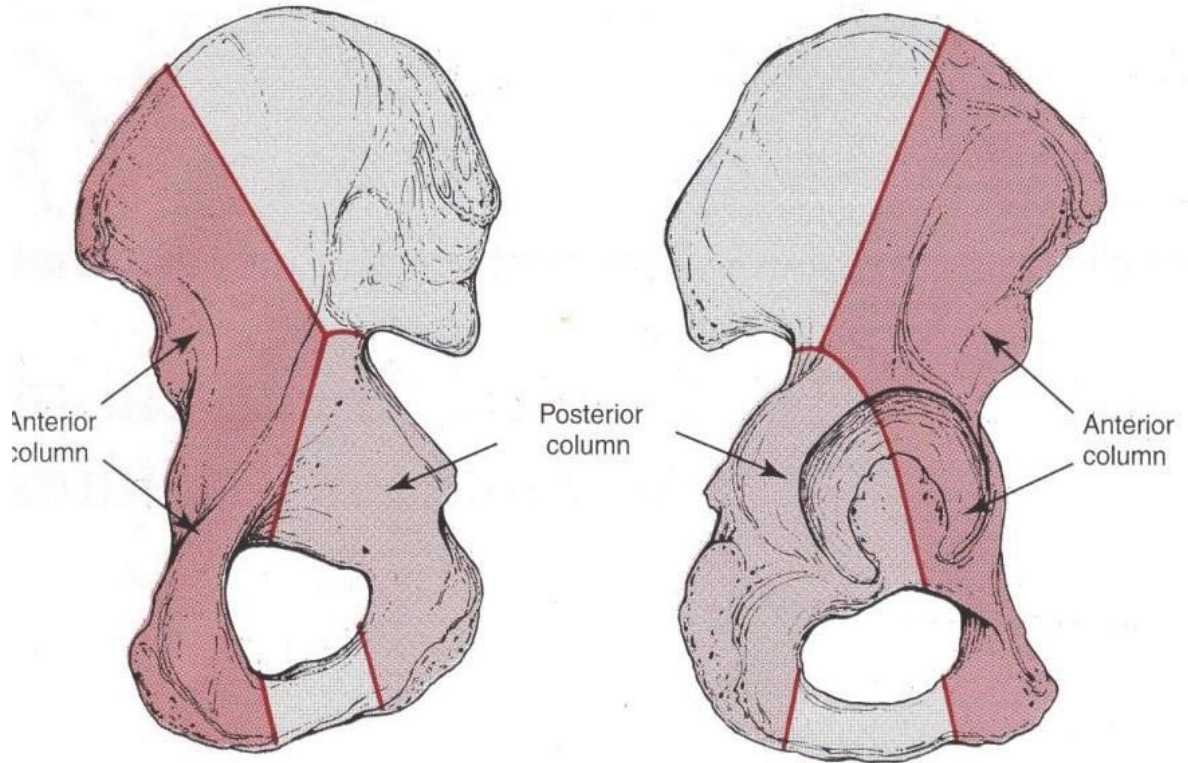
The Front Column Consists of

Ischial portion of the bone,

including the greater and lesser sciatic notch,

Posterior wall of the acetabulum,

and Ischial tuberosity



Obturator Artery

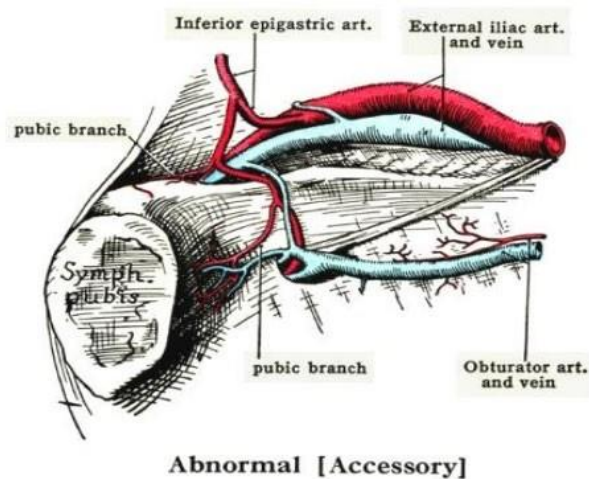
- Is internal iliac artery-derived (70%)
- Small diameter anastomoses connect the external iliac to obturator.

In most cases, the pubic branches of the obturator and inferior epigastric arteries join behind the body of the pubis.

This aberrant vessel is of substantial size in a tiny percentage of cases.

calibre and, if used carelessly, could cause significant bleeding.

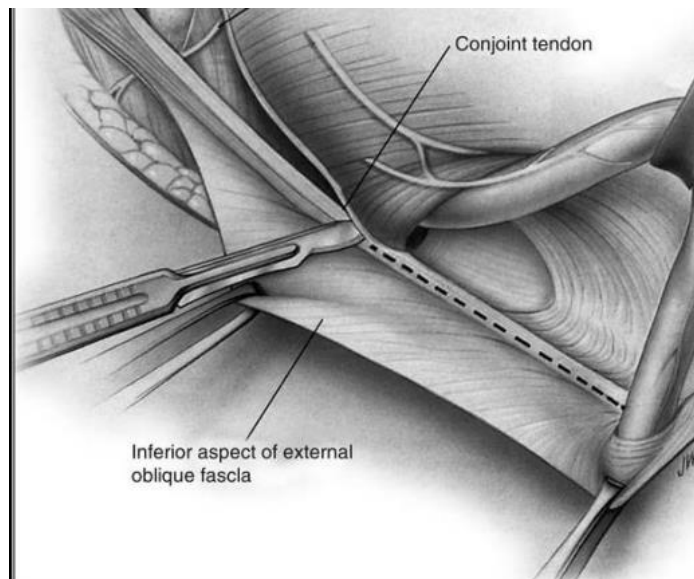
- This is referred to as the Corona Mortis



Anterior exposure:

Lateral cutaneous nerve: At this degree of dissection, it will almost definitely be necessary to separate lateral cutaneous nerve of the thigh from the anterior superior iliac spine.

Femoral nerve: Under iliopsoas muscle, the nerve passes under the inguinal canal. Since extending the nerve will cause the quadriceps muscle to become paralysed, vigorous retraction must be avoided.



Other structures :

The vas deferens and testicular artery are located within the spermatic cord. Despite its ease of mobilisation, the testicle must be handled delicately during the approach and closure to prevent ischemia injury.

Off the rear of the symphysis pubis, the bladder is simply mobilised. The bladder may have suffered injury and developed adhesions as a result of fractures impacting the lower half of the anterior column.

Mechanism of injury

The femoral head, which transmits stress from the femur to the pelvis, causes acetabular fractures.

Therefore, The fracture is influenced by

- the hip's position at the time of the accident,
- Orientation and
- The size of the effect.

The intensity of the applied force and the strength of the bone to which it is applied determine the amount of displacement and the level of comminution or articular impaction. An osteoporotic patient may suffer a highly comminuted fracture from a relatively low-energy event.

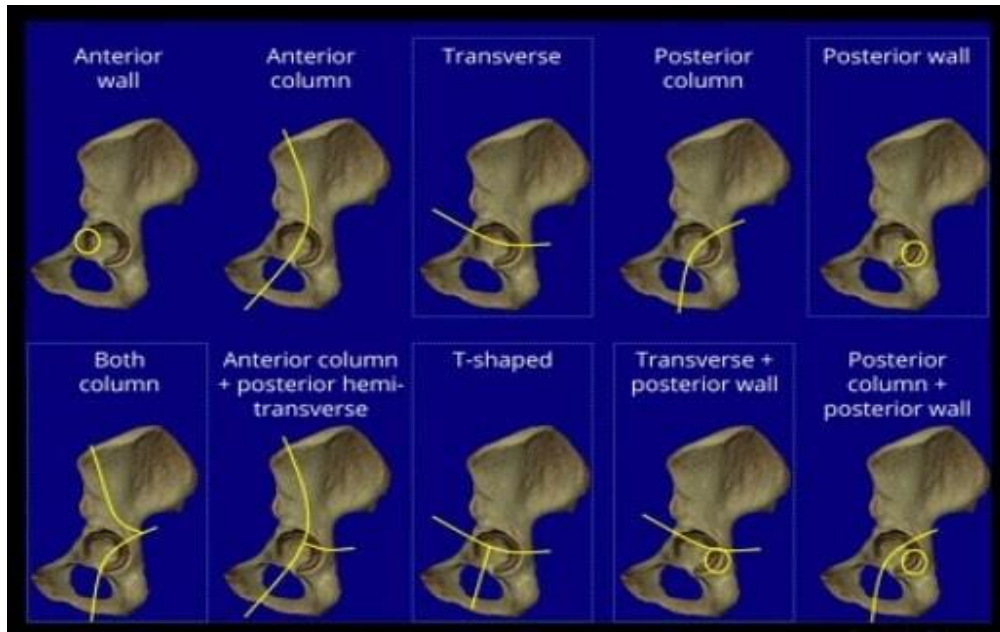
Force applied and fracture pattern:

Fracture classification

Understanding the injury and determining the appropriate surgical strategy depends on the classification of acetabular fractures. An in-depth understanding of the fracture anatomy is necessary to choose the best surgical strategy and different fixing methods.

“Letournel and Judet's anatomical classification” is divided into five patterns in each of the two main categories of elementary and associated fractures.

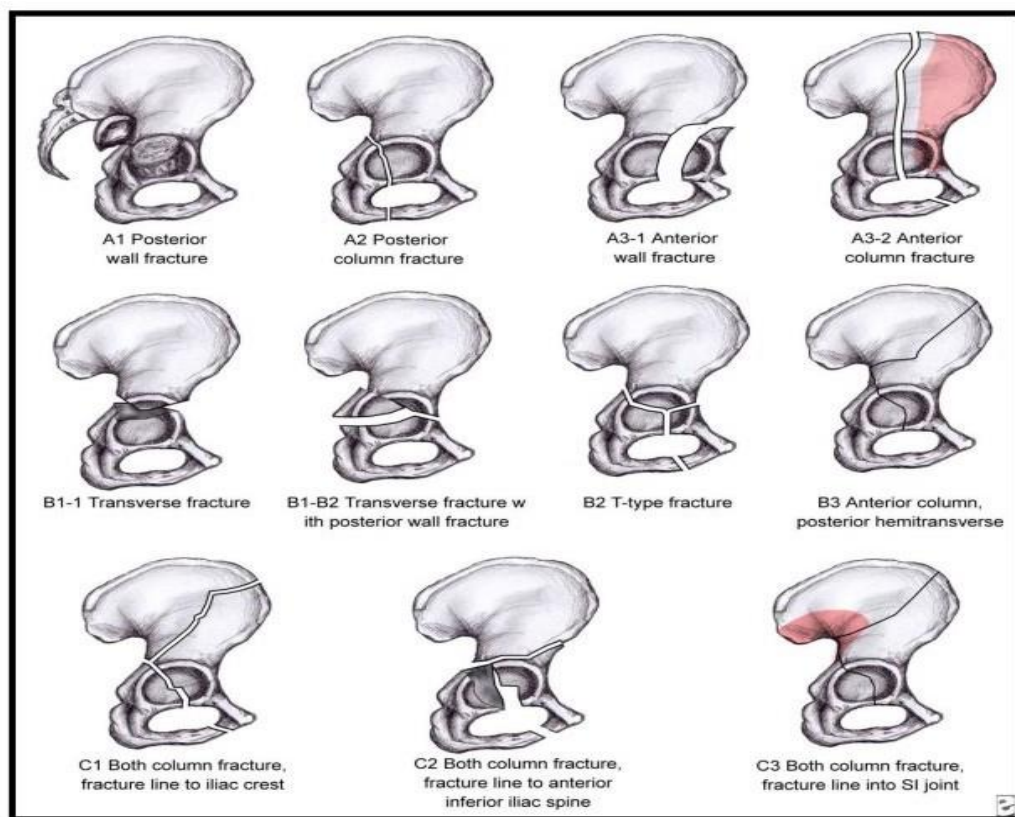
JUDET AND LETOURNEL CLASSIFICATION ⁹



LETOURNEL AND JUDET CLASSIFICATION

Tile described a modification of Letournel's classification. This modification enables these complex fracture patterns to be categorized into the A, B, and C types of the comprehensive classification of fractures developed by the Arbeitsgemeinschaft Für Osteosynthesefragen. This modification's purpose is to "enable surgeons to speak the same language" and to help in prognosis.

Comprehensive Classification: Acetabulum Fractures



Ao Classification

Clinico-radiological assessment

Although acetabular fractures without a concurrent pelvic ring injury seldom result in life-threatening haemorrhage, any hemodynamically unstable patient must be thoroughly examined and given urgent treatment in accordance with ATLS standards.

A quick primary examination of the airway, any bleeding, the patient's CNS condition, and hemodynamic resuscitation if necessary are all included in the general assessment.

A comprehensive skeletal examination, a belly and pelvic exam, and a CNS exam are all required as part of the secondary survey.

History is crucial because it reveals the amount and direction of the force that caused the injury, which in turn determines the fracture's pattern, displacement, and comminution.

Physical examinations involve a thorough search for bruises, cuts, contusions, and external injuries. Look for more level lesions and meatus haemorrhage with particular care. It's critical to evaluate the injured limb's distal neurovascular state and attitude.

The head can be felt as a globular mass during a rectal examination, which may reveal central dislocation.

Radiological assessment:

“The typical approach consists of three images of the acetabulum and a CTScan:

- Anteroposterior pelvis
- Judet views (Iliac oblique and Obturator oblique)
- CT scan of Pelvis with 3-D reconstruction”

AP pelvis

- This image displays

the pelvic brim, which makes up the anterior 3/4 of the iliopectineal line, and the lower half of the internal surface of the sciatic buttress, which makes up the posterior 1/4 of the line,

Quadrilateral surface correlates to the iliaoschial line.

the teardrop-shaped by

Inner limb: The obturator canal's outside

Middle third of the cotyloid fossa on the external limb, and the inferior border's ischiopubic notch

The superior weight-bearing portion of the acetabulum is represented by the acetabular roof.

Lateral extensions of articular surfaces are represented by the anterior and posterior walls.

injuries related to the pelvic rings

acetabular fractures on both sides

Broken femoral heads

displacement of the fracture

femoral head congruency in the acetabulum.

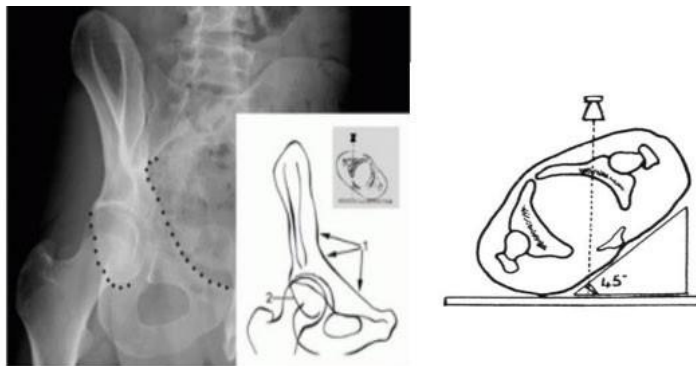
Judet Oblique Radiographs¹⁵

These pelvic radiographs are 45-degree oblique. The acetabular columns are highlighted. To ensure appropriate rotation, the coccyx tip should be located above the femoral head's midline.

Obturator (Internal) Oblique¹⁵

The wounded side is up in this picture. Over the contralateral femoral head, the coccyx is centred.

- In profile, the obturator foramen
- emphasises the pelvic boundary, posterior wall, and anterior column
- Check the femoral head's alignment with the acetabulum.

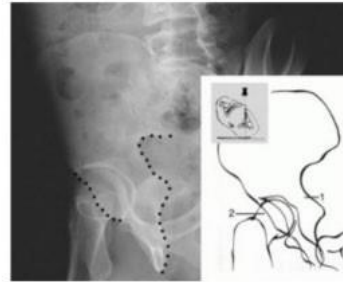
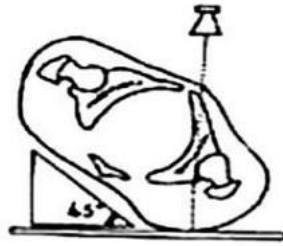


Iliac (External) Oblique¹⁵

The affected side is down in this picture. Coccyx positioned across the opposite femoral head

- Profile of an iliac wing

- highlights the quadrilateral plate, anterior wall, innominate bone's posterior border, and posterior column.
- Check the femoral head's alignment with the acetabulum.

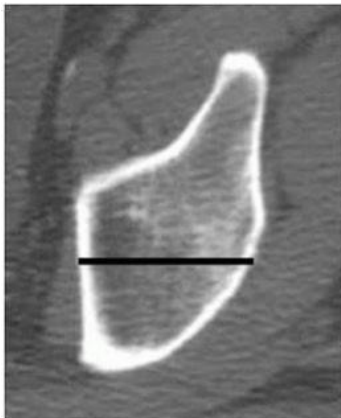


CT scan⁹

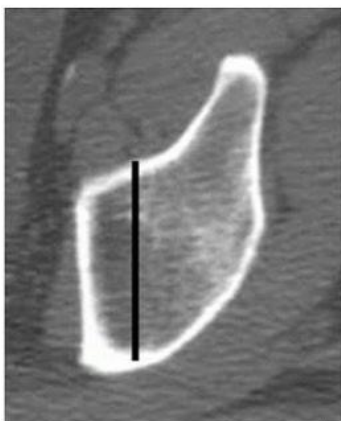
The use of a CT scan can help with fracture line identification that is not visible on radiographs, fracture line orientation, the T-type acetabular fractures' vertical part, and fracture fragment rotation. We clearly see each other.

- broken acetabular walls
- loose particles inside the joints
- Affected fragment in the margin
- Strength of the fracture comminution
- Amount of comminution of fractures

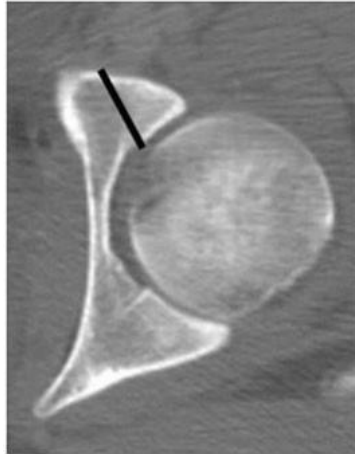
- a femoral head tumour
- Joint Congruence
 - the pelvic posterior ring and the SIJ



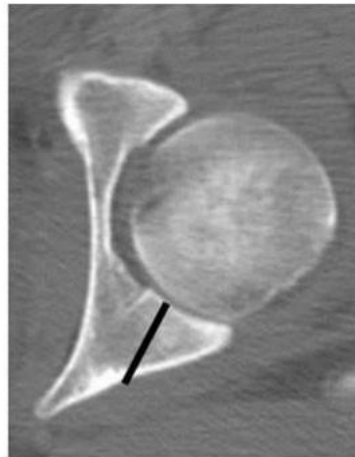
Fracture of one or both column



Transverse fracture of acetabulum



Anterior wall fracture



Posterior wall fracture

3-D CT scan

It is a conversion of data from a two dimensional CT scan. Software determines the quality of the image. allows for femur subtraction. provides an excellent overall image of the fracture configuration by allowing for pelvic rotation.

Treatment protocol:

General assessment and resuscitation

The Advanced Trauma Life Support (ATLS) protocol should be utilised for overall assessment, resuscitation, and identification of skeletal and related injuries, particularly vascular and nerve injuries of the affected lower limb. The patient is then radiographically evaluated following stabilisation.

Anteroposterior x-rays, For the radiological evaluation, The acetabulum was scanned using Judet (Iliac and Obturator oblique) and ct with 3-d reconstruction.

All patients received lower skeletal traction and closed reduction under intravenous anaesthesia for patients with broken or dislocated bones.

Timing of surgery

Within 21 days of the injury, internal fixation and open reduction must be carried out.

Surgical exposure

Anteroposterior, judet views, and computed tomography are used to characterise the kind and pattern of fracture. For anterior fractures, modified stoppa -technique was adopted. At first, internal fixation, open reduction, and single exposure were used. After the procedure, X-rays were performed, and the decision to employ another with fracture reduction was made.

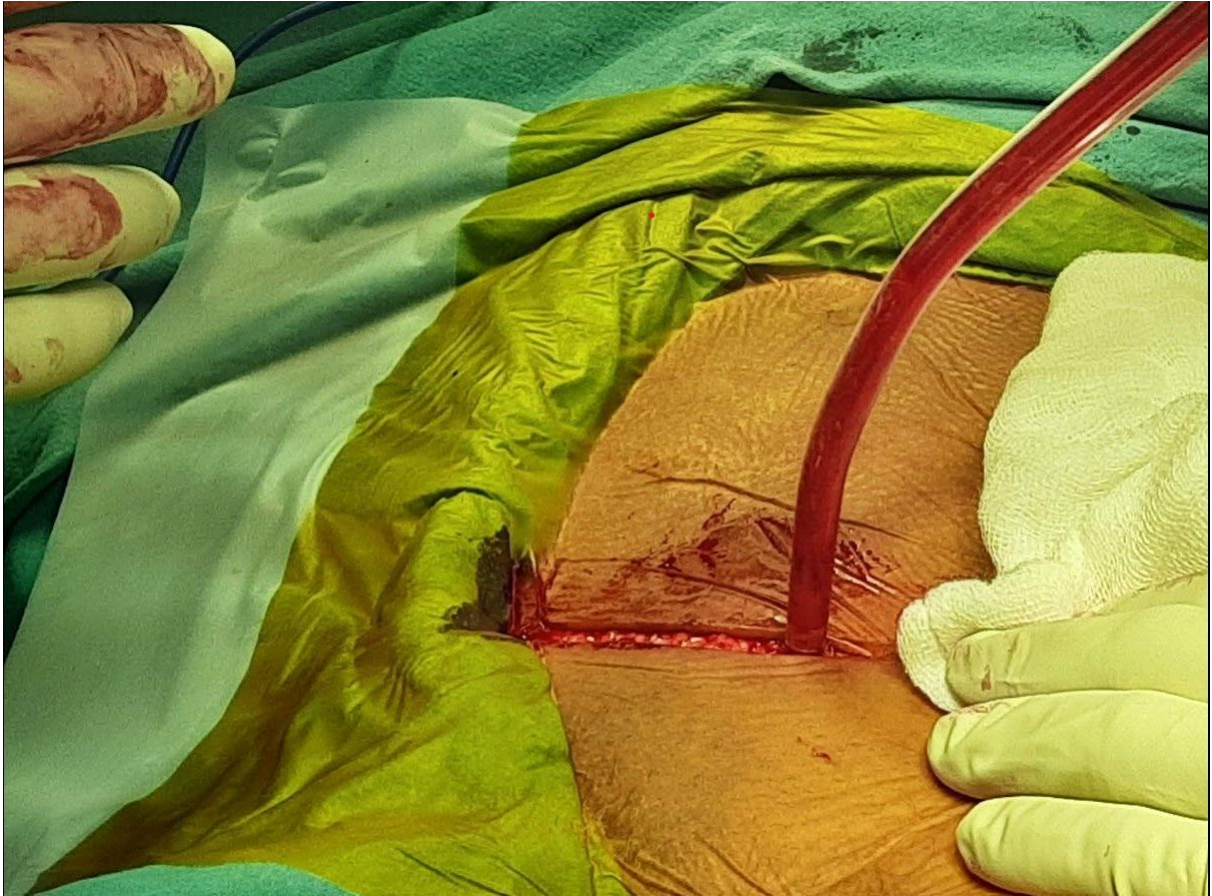
“Modified Stoppa’s Approach:

This Approach gives you access to

- Pubic body,
- Superior pubic ramus
- Pubic root, • Ilium above and below the pectineal lune,
- Quadrilateral plate,
- Medial aspect of the posterior column,
- Sciatic buttress, and
- Sacroiliac joint”

On a flat radiolucent table, the patient is positioned supine. For bladder protection, the bladder is catheterized with a Foley's catheter, assessment of fluid balance by visualisation. To aid in relaxing the femoral neurovascular systems, the afflicted leg is draped with the knee and hip bent, the iliac crest, and the iliopsoas muscle. The entire abdomen is visible in the surgical field, including the palpable pubic bodies below and the iliac crests above.

Antibiotics are administered preventatively 30 minutes prior to surgery. The surgeon is holding a lamp from his right side while standing on the side opposite the affected acetabulum. Along the bikini line, a transverse curvilinear skin incision is made that extends up to the anterior rectus fascia, 1 to 2 fingerbreadths above the pubic symphysis. Avoid dissection that extends too far laterally to avoid injuring the round ligament or spermatic cord that emerge through the superficial inguinal ring.

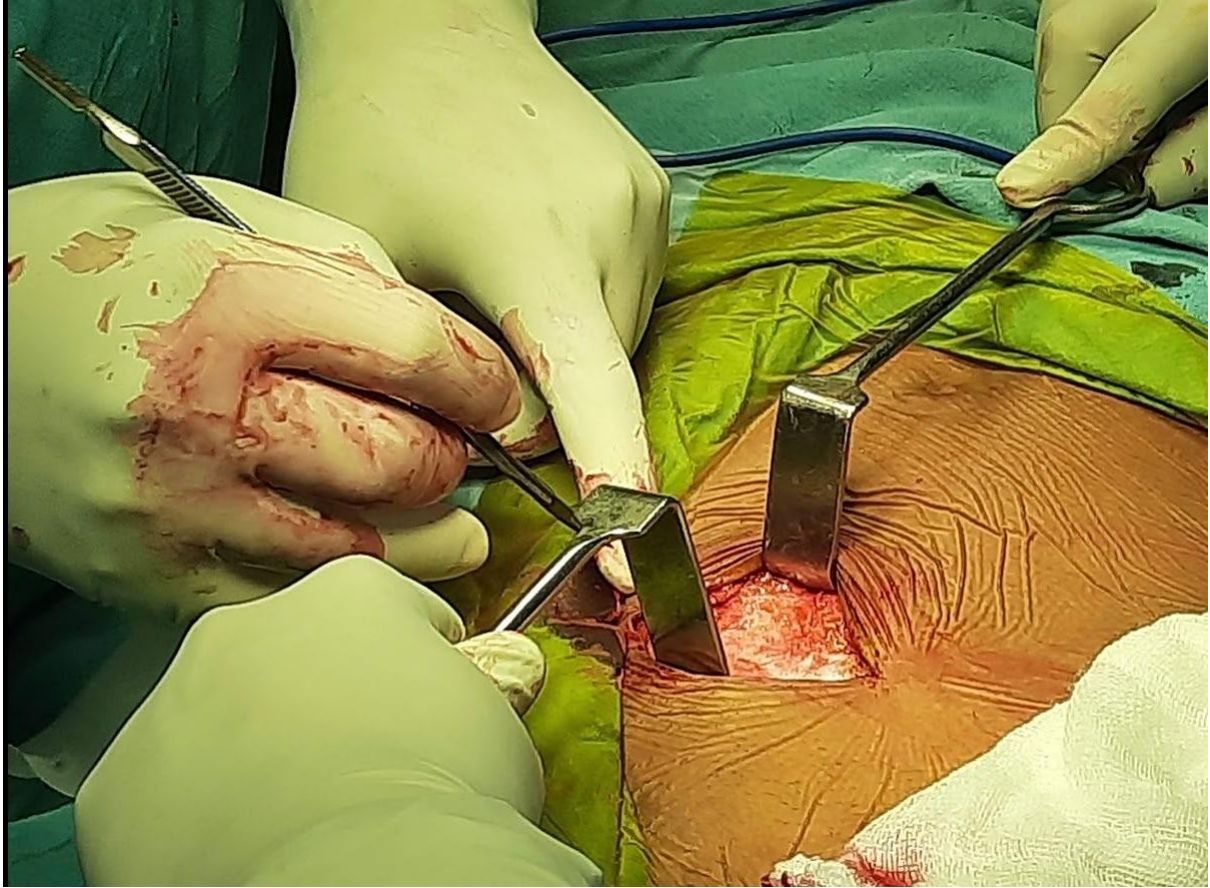


SUPERFICIAL SKIN INCISION EXTENDING UP TO THE ANTERIOR RECTUS FASCIA, 1 TO 2 FINGERBREADTHS ABOVE THE PUBIC

The crosslinked fibres of linea alba split the rectus abdominis muscle vertically and to access Retzius' retropubic region, the transversalis fascia is cut , This is enhanced by finger dissection, which further removes the anterior pelvic ring and bladder from the surgical site.

The dissection will now take place in the additional peritoneal space between the natural pelvis and the prosthetic pelvis. Although the insertion of the rectus abdominus muscle, the anterosuperior, pubic tubercle, and superior 38 ramus of the pubic bodies are all eliminated, the front portion of the pubic bodies remain intact. By loosening the periosteum and

iliopectineal fascia, more lateral dissection along the superior ramus and pubic root is made possible.

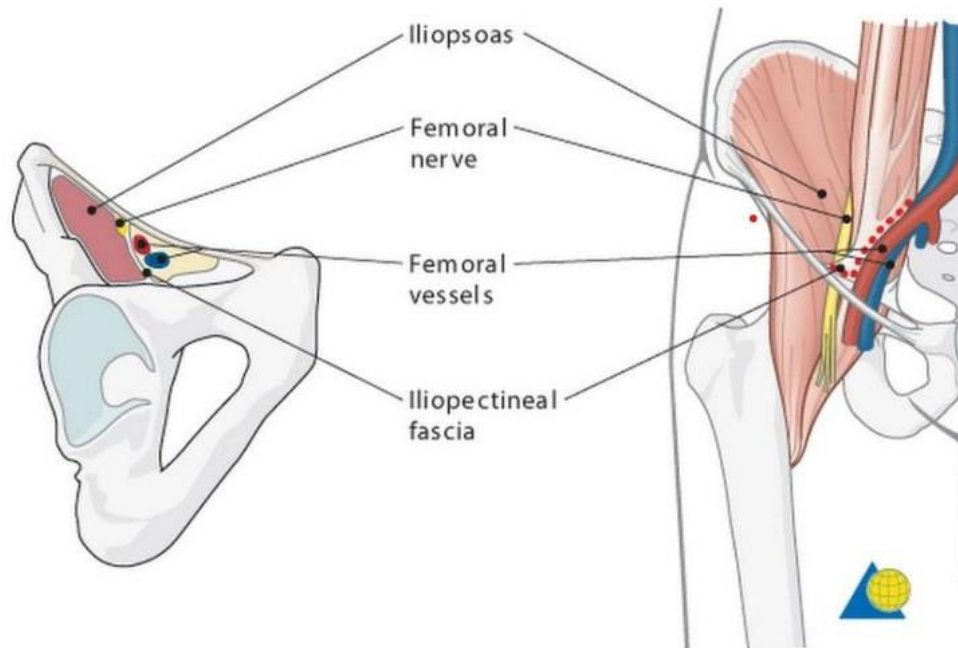


SPLITTING ALONG THE FIBRES OF LINEA ALBA

As they move toward the obturator foramen after crossing the Superior ramus

It is demonstrated that the obturator and external iliac arteries have anastomoses. These vessels could be diathermically cauterised depending on their size. silk material was used to ligate, or removed from the pelvic brim and pubic root after being cut. The iliopsoas is elevated subperiosteally, dividing the vascular tissues and muscle along the pelvic brim, the iliopectineal fascia and continuing the incision along the periosteum. The internal Corona

mortis 40 iliac fossa and anterior column will now be seen. After the pelvic brim and internal iliac fossa have been revealed, You'll be able to observe the quadrilateral surface and posterior column.



the medially shifted posterior column and quadrilateral surface, are easier to see when the femoral head is retracted laterally. This also relieves pressure on the obturator neurovascular systems. An additional incision is made along the iliac crest to allow for reduction and the insertion of fixation in fractures that require the use of posterior column lag screws or those with a sizable anterior column component. Starting 2 cm posterior to the anterior superior iliac

spine, A second incision, resembling the one used for bone grafting, is made posteriorly along the crest. Severing the connection of the external oblique muscle allows dissection across the crest and into the internal iliac fossa. It will then be possible to see the iliacus muscle, elevate it subperiosteally, and attach it to the anterior sacroiliac joint.



Reduction techniques:

During the anterior approach, a schanz pin or a farabeuf clamp was inserted into the iliac crest to manage and reduce. The Picador ball spike pusher and The Matta quadrangular clamp comes in several sizes and offsets, and it's an essential instrument for acetabular surgery. For lagging, either 3.5 mm cortical screws with washers or 4 mm cancellous screws were employed. Neutralization plates are 3.5mm Reconstruction plates.



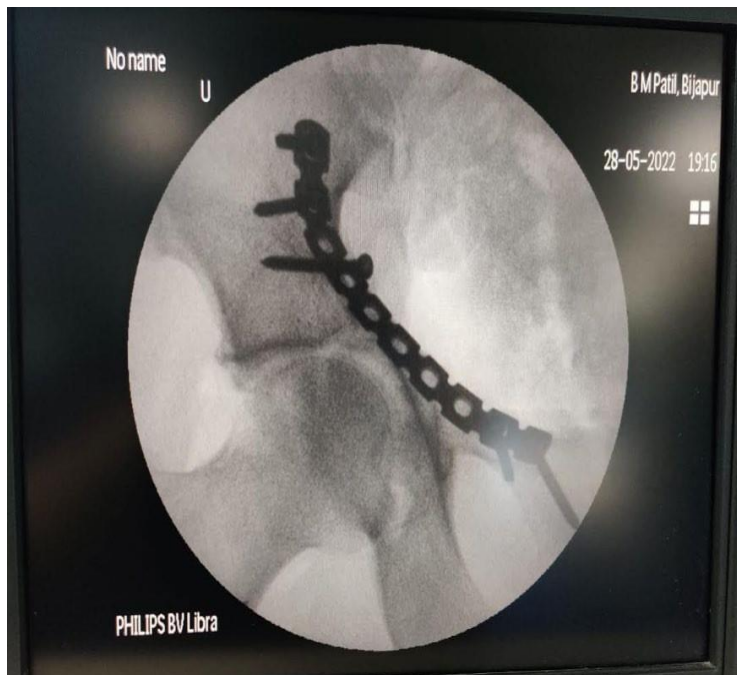
PLATE CONTIURED BEFORE PLATTING



**REDUCTION CONFIRMED UNDER
C-ARM**



INTRA OPERATIVE PLATE PLACEMENT



**INTRAOPERATIVE PLATE PLACEMENT
CONFIRMATION USING C-ARM**

**SKIN SUTURING WITH CLAMP
PLACEMENT**





**POST OPERATIVE
CATHETERISATION**

Post-operative protocol:

Antibiotics were administered to every patient prior to surgery and for five to seven days following.

Disposal of drain on second postoperative day

Incision sutures were removed between days 12 and 14.

For three weeks, oral indomethacin¹⁶ 25mg TDS was administered.

Mobilization was started 3 weeks after surgery.

When the fracture had mostly healed by the third or fourth month, weight bearing was begun.

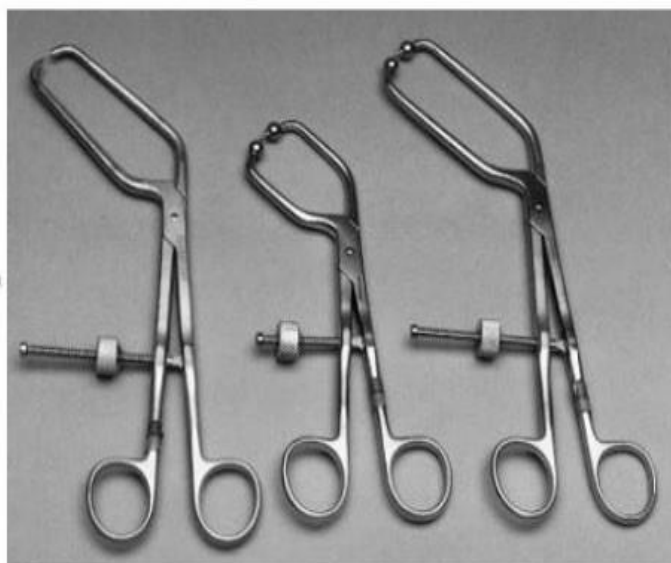
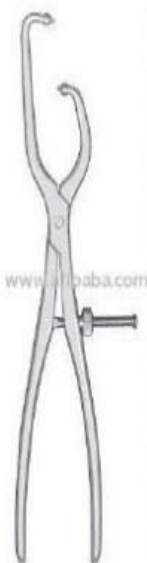
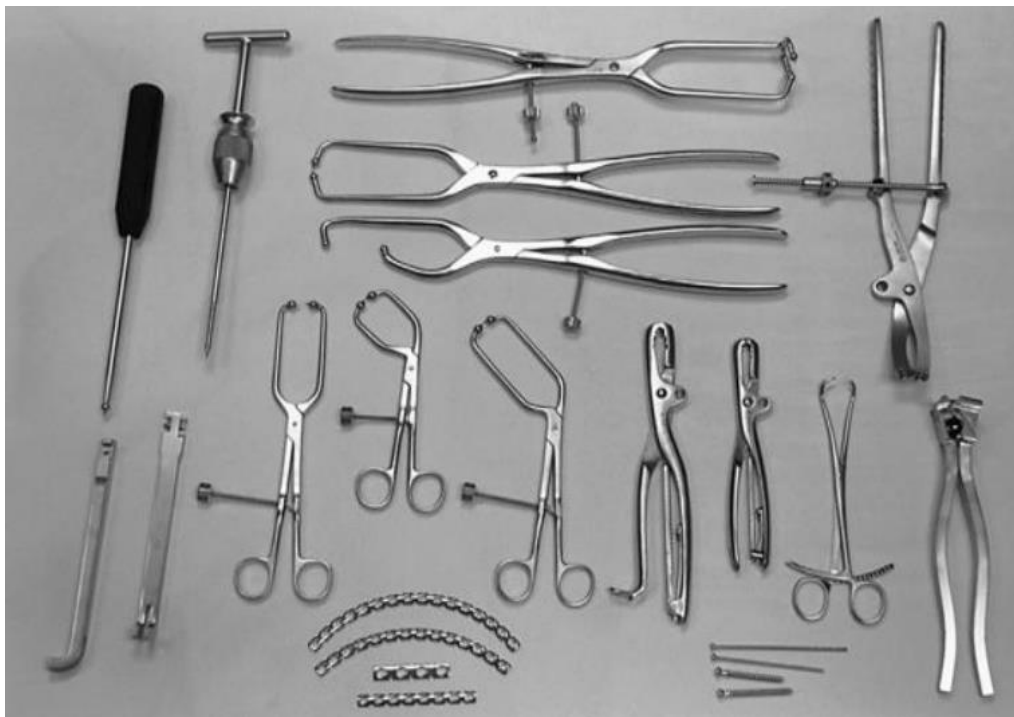
For the first six months, a radiological and functional evaluation was performed monthly, and then every third month after that.

Analysis

The Modified Merle d'Aubigne score was used to evaluate the patients following surgery at each follow-up.

Acetabular fracture treatment devices and implants

AO ACETABULUM INSTRUMENTS



MATTA'S QUADRNGULAR CLAMP



FARABEUFS CLAMPS

MATERIALS AND METHODS

SOURCE OF DATA:

1. Shri B. M. Patil's Medical College, Hospital and Research Centre, Vijayapura with a diagnosis of anterior acetabular fracture. Patients admitted to the Department of Orthopedics in BLDE (DEEMED TO BE UNIVERSITY)
2. The patients were informed about the study in all respects, and informed written consent would be obtained.
3. The period of study was from January 2021 - May 2022.
4. Follow up period was six weeks, three months, six months.

METHOD OF COLLECTION OF DATA:

- Patients admitted in Department of Orthopedics in BLDE (DEEMED TO BE UNIVERSITY) Shri B. M. Patil Medical College, Hospital and Research Centre,
- By clinical examination.
- History taking.
- Diagnosis-Clinical and radiological

INCLUSION CRITERIA

1. Patient aged 18 years and above.
2. Superior pubic ramus fracture
3. Anterior column acetabular fracture
4. Willingness to take part in the rehabilitation programme and a follow-up.
5. Patients willing for treatment and giving informed and written consent.

EXCLUSION CRITERIA

1. Active infection

2. Patient with posterior wall fracture
3. Pathological fracture
4. Age less than 18years
5. Patient with severe osteoarthritis of hip joint
6. Patients unfit for Surgery
7. Patient refused surgery

Sample size calculation

With the anticipated Proportion of anatomic reduction among Acetabular fracture patients 80.5 %⁽²⁾, A sample size of 30 patients, with a 95% degree of confidence and a 15% absolute precision, was used in the investigation.

Formula used

- $$N = \frac{z^2 p * q}{d^2}$$

Where Z= Z statistic at α level of

significance d^2 = Absolute error

P= Proportion rate

$q= 100-p$

Type of study

Prospective study

Statistical analysis

- Using a statistical tool for the social sciences, statistical analysis was carried out on the acquired data using a Microsoft Excel sheet (Version20).
- Counts and percentages, graphs, and the mean (median) SD were used to display the results.

- The Wilcoxon signed-rank test or the Paired t-test were used to compare the results.

An independent t-test will be used to compare the two groups' values for normally distributed continuous variables. The Mann-Whitney U test was applied to variables that were not regularly distributed.

In this study, routine, standardised methods were essential for any investigations or interventions. This study did not involve any animal testing.

INVESTIGATIONS

- X-ray PBHS with obturator and iliac view
 - CT pelvis with 3Dreconstruction
 - Complete blood count.
 - ESR
 - Bleeding time, Clotting time.
 - e- Albumin, sugar and Microscopy.
 - Random blood sugar, serum creatinine, and blood urea.
 - HIV and Hbs Ag and HCV
 - Blood grouping and Rh-typing.
 - ECG.
 - 2D echo if necessary.
 - X-ray of the chest: Postero-anterior view.
 - If required, a computed tomography scan.
- Other targeted investigations as required.

TREATMENT:

- Analgesics
- Anesthesia used – Spinal Anesthesia/ Epidural Anesthesia /

General Anesthesia.

- **SURGERY – MODIFIED STOPPAAPPROACH**

- **POST OP**

- • Use a plain xray of the pelvis with the hips and obturator in the oblique and judet views to verify the accuracy of the reduction.
 - For the first three months, limit mobilisation to toe-touching weight-bearing.
 - . If fracture consolidation is seen three months after surgery, permit full weight-bearing as tolerated with a physiotherapist's help.⁹

- **FOLLOW UP**

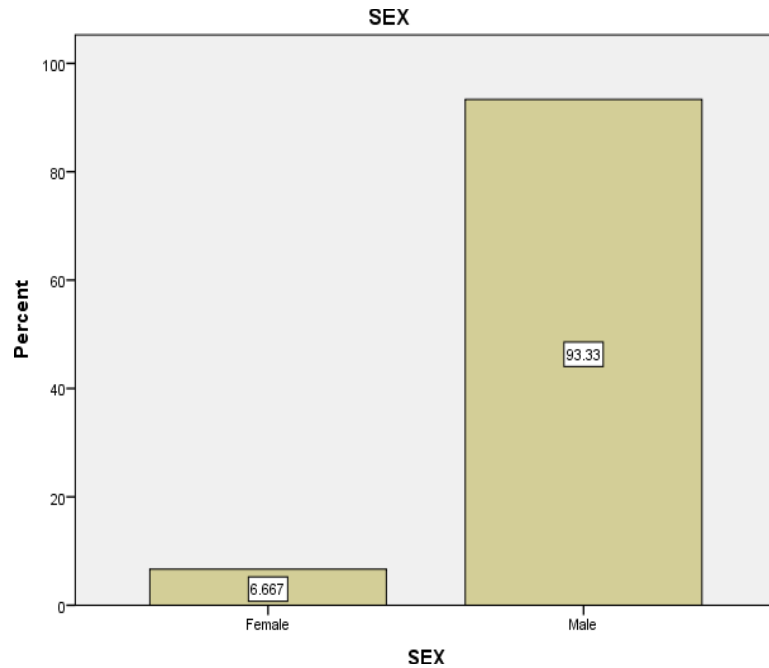
- Post-operative time:6 weeks/3 months/6months
 - Radiological evaluation – check X-RAY Pelvis with both hips.

RESULTS

In our investigation, a thorough clinical examination and radiological evaluation were conducted after the patients had received general resuscitation. The lower femoral pin traction was applied to the patients. A total of 30 cases were included, with maximum number 28 (93.3%) cases being males and 2 (6.6%) cases were females. (table1, graph1)

Sex	Frequency	Percent
Female	2	6.7
Male	28	93.3
Total	30	100.0

TABLE 1- FREQUENCY TABLE SHOWING SEX INDICES



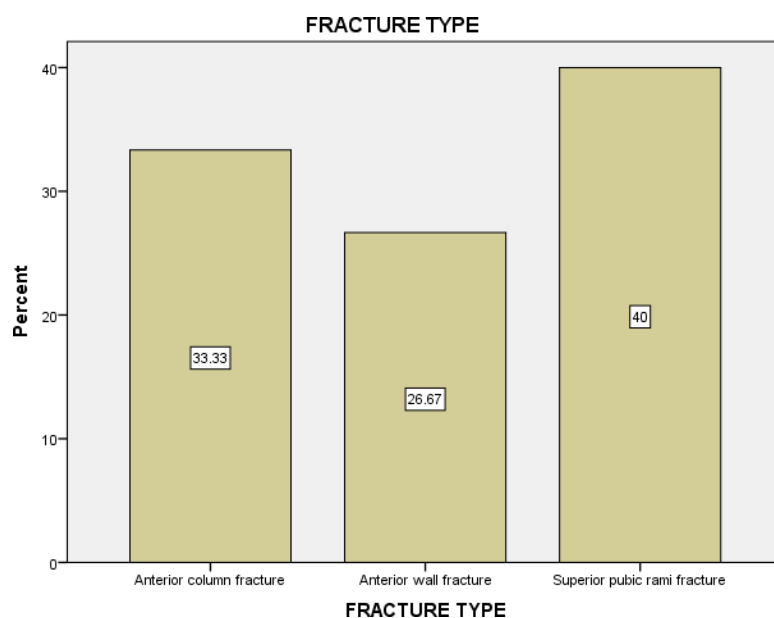
GRAPH 1- SHOWING PERCENTAGE DISTRIBUTION BASED ON SEX OF THE PATIENT

A total of 30 cases studied included maximum, 12(40%) cases of superior pubic rami fracture, followed by 10(33.3%) cases and 8(26.7%) cases of anterior wall and anterior column fracture (table2, graph2)

FRACTURE TYPE	Frequency	Percent
Anterior column fracture	10	33.3

Anterior wall fracture	8	26.7
Superior pubic rami fracture	12	40.0
Total	30	100.0

TABLE 2- FREQUENCY TABLE SHOWING DISTRIBUTION OF TYPE OF FRACTURE



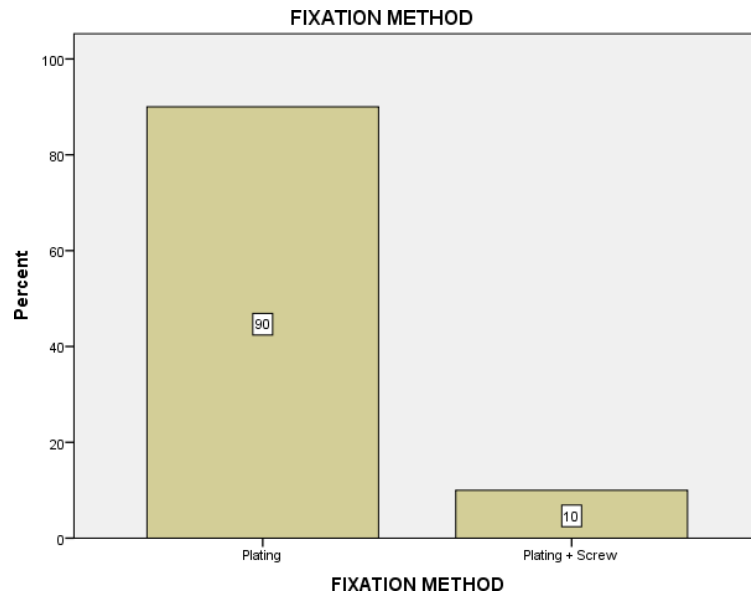
GRAPH 2- SHOWING PERCENTAGE DISTRIBUTION OF PATIENT BASED ON TYPE OF FRACTURE

In our study, in 27(90%) cases, fixation was done using plate while in 3(10%) cases plating and screw was the method of choice for fixation.(table3, graph3)

FIXATION METHOD	Frequency	Percent
Plating	27	90.0

Plating + Screw	3	10.0
Total	30	100.0

TABLE 3- FREQUENCY TABLE SHOWING METHOD OF FIXATION USED



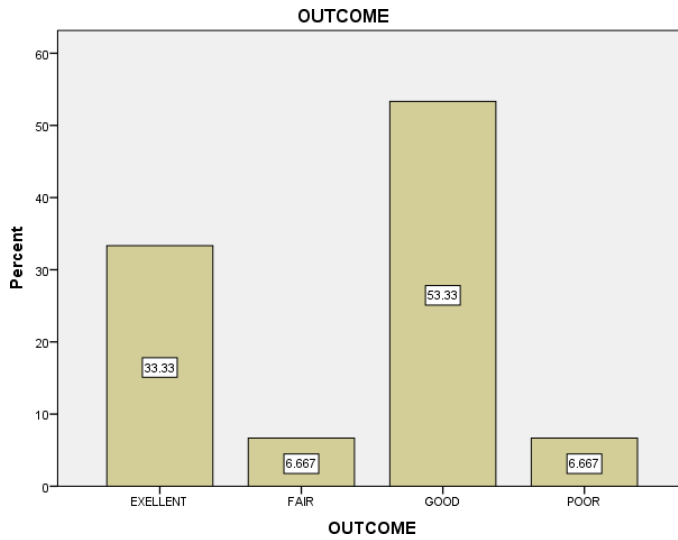
GRAPH 3- SHOWING PERCENTAGE DISTRIBUTION OF PATIENT BASED ON METHOD OF FIXATION

In our study we observed favourable outcome using modified stoppa’s surgical approach, with a maximum of 16(53.3%) cases showing good outcome followed by 10(33.3%) cases

showing excellent outcome, while only 2(6.7%) cases each showed fair and poor status respectively following the surgery(table4, graph4)

OUTCOME	Frequency	Percent
EXELLENT	10	33.3
GOOD	16	53.3
FAIR	2	6.7
POOR	2	6.7
Total	30	100.0

TABLE 4- FREQUENCY TABLE OF PATIENT OUTCOME OF THE PATIENT POST SURGERY

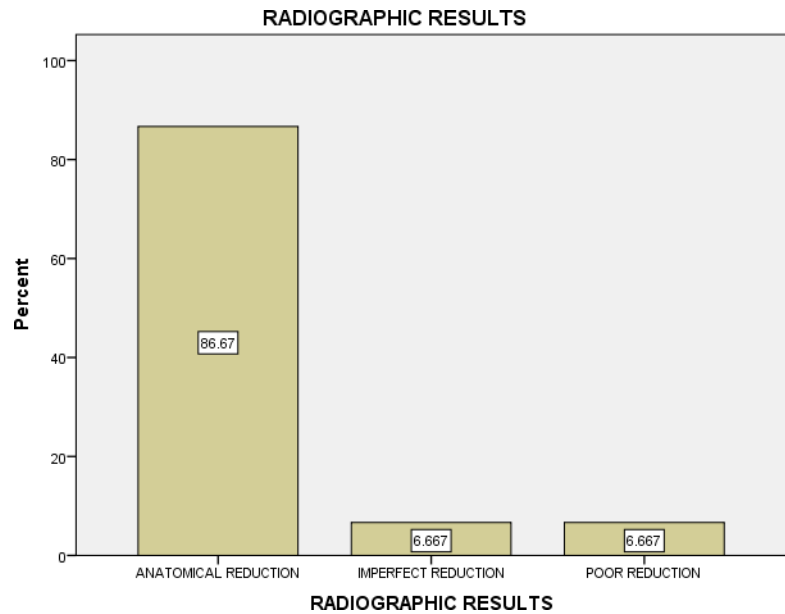


GRAPH 4- SHOWING PERCENTAGE DISTRIBUTION OF PATIENT BASED ON OUTCOME OF THE PATIENT POST SURGERY

The radiographic results post surgery of the patients showed that in maximum cases i.e in 26(86.9%) cases we could achieve anatomical reduction, where as in 2 (6.7%) cases each imperfect and poor reduction was observed respectively.(table5, graph5)

RADIOGRAPHIC RESULTS	Frequency	Percent
ANATOMICAL REDUCTION	26	86.7
IMPERFECT REDUCTION	2	6.7
POOR REDUCTION	2	6.7
Total	30	100.0

TABLE 5- FREQUENCY TABLE SHOWING RADIOGRAPHIC RESULTS OF PATIENT POST SURGERY



GRAPH 5- SHOWING PERCENTAGE DISTRIBUTION OF PATIENT BASED ON RADIOGRAPHIC RESULTS OF THE PATIENT POST SURGERY

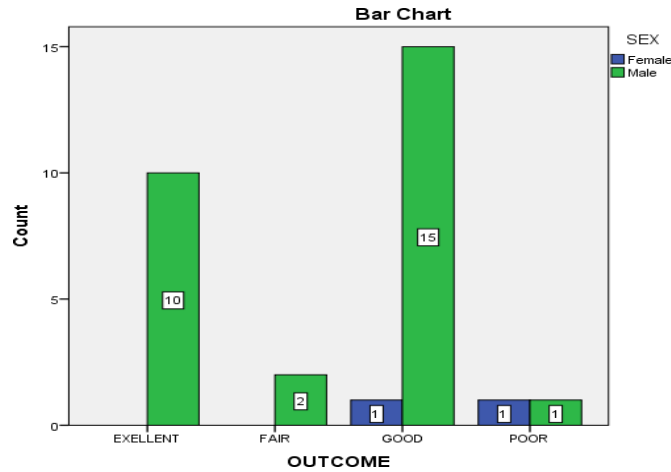
To do the Analysis of anova first we need to cheu testing of normality if normality test found we will use Anova otherwise, will use krusk willy test in our case outcome and surgery.

Considering the patient's sex while evaluating the patient's post-operative results, out of 16 cases which showed good prognosis 15 were males and 1 was female, while all the 10 male cases operated showed excellent prognosis. We did not find any statistically significant correlation between the sex and out come of the patient post surgery(p value=0.075)

OUTCOME	SEX		Total	Chi-square Value	p-value
	Female	Male			
EXELLENT	0	10	10	6.897	0.075
GOOD	1	15	16		
FAIR	0	2	2		
POOR	1	1	2		
Total	2	28	30		

TABLE 6- SHOWING COMPARISON OF OUTCOME OF THE PATIENT POST SURGERY WITH SEX OF THE PATIENT

GRAPH 6- SHOWING COMPARISON OF OUTCOME OF THE PATIENT POST SURGERY WITH SEX OF THE PATIENT



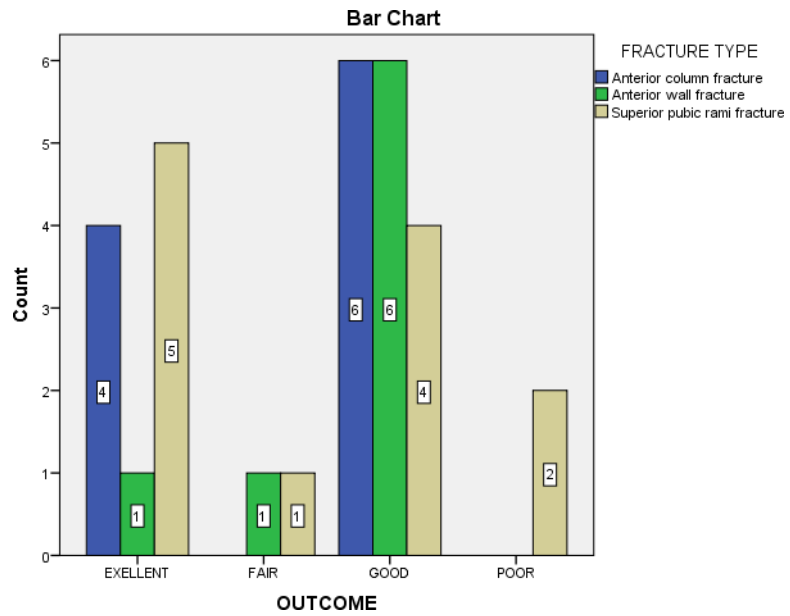
On comparison of outcome of the patient post surgery with the type of fracture operated, in our study we observed, Good outcome in maximum number of cases, of which 6 cases each belonging to anterior column fracture and anterior wall fracture followed by 4 cases of superior pubic rami fracture. We also observed excellent outcomes in 5 cases belonging to superior rami fracture, followed by 4 cases of anterior column fracture. No statistical correlation was observed (pvalue=0.299) (table 7, graph7)

OUTCOME	FRACTURE TYPE			Total	CHI square test	P-value
	Anterior column fracture	Anterior wall fracture	Superior pubic rami fracture			
EXCELLENT	4	1	5	10	7.238	0.299
FAIR	0	1	1	2		
GOOD	6	6	4	16		
POOR	0	0	2	2		

Total	10	8	12	30	
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TABLE 7- SHOWING COMPARISON OF OUTCOME OF THE PATIENT POST SURGERY WITH TYPE OF FRACTURE

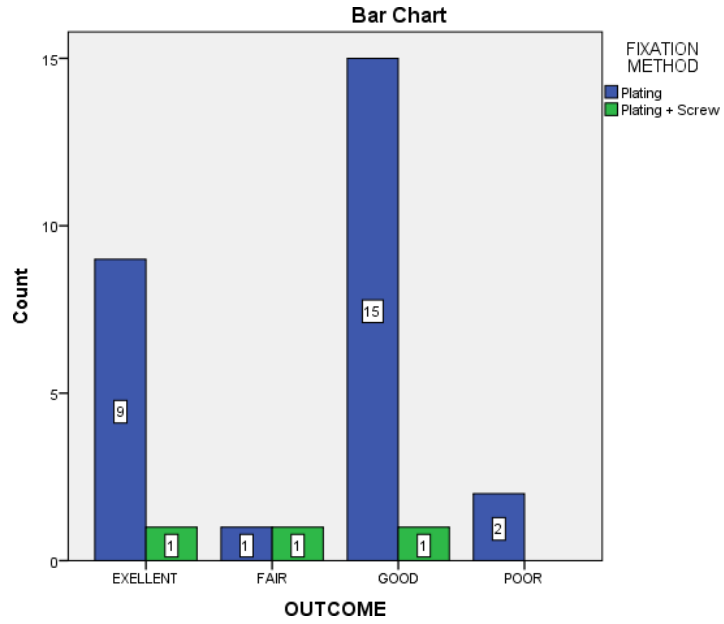
GRAPH 7 - SHOWING COMPARISON OF OUTCOME OF THE PATIENT POST SURGERY WITH TYPE OF FRACTURE



On comparing outcome of the patient post surgery with the method of fixation used, in our study we observed excellent outcomes when the fixation method of choice was plating with a total of 9 cases, also a good outcome was observed in 15 cases with plating as fixation method, although no statistical correlation was observed between the two.(p value=0.258)(table8, graph8)

OUTCOME	FIXATION METHOD		Total	CHI square test	P-value
	Plating	Plating + Screw			
EXELLENT	9	1	10	4.028	0.258
FAIR	1	1	2		
GOOD	15	1	16		
POOR	2	0	2		
Total	27	3	30		

TABLE 8- SHOWING COMPARISON OF OUTCOME OF THE PATIENT POST SURGERY WITH METHOD OF FIXATION

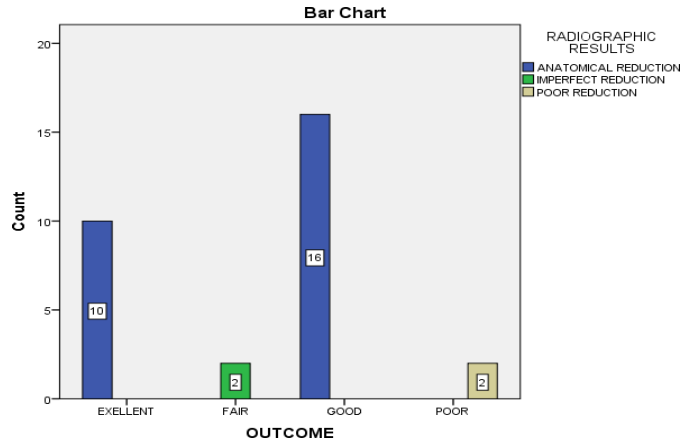


GRAPH 8- SHOWING COMPARISON OF OUTCOME OF THE PATIENT POST SURGERY WITH METHOD OF FIXATION

On correlating outcome of the patient with the radiographic results in our study we observed excellent outcome in all the 10 cases which showed anatomical reduction, and good outcome in all 16 cases in which anatomical reduction was achieved, 2 cases of imperfect reduction showed fair outcome while 2 cases of poor reduction showed poor outcome. Statistically significant correlation was observed (p value=0.0001) (table9, graph9)

OUTCOME	RADIOGRAPHIC RESULTS			Total	CHI square test	P-value
	ANATOMICAL REDUCTION	IMPERFECT REDUCTION	POOR REDUCTION			
EXELLENT	10	0	0	10	60.000	0.0001
FAIR	0	2	0	2		
GOOD	16	0	0	16		
POOR	0	0	2	2		
Total	26	2	2	30		

TABLE 9- SHOWING COMPARISON OF OUTCOME OF THE PATIENT POST SURGERY WITH RADIOGRAPHIC RESULTS



GRAPH 9- SHOWING COMPARISON OF OUTCOME OF THE PATIENT POST SURGERY WITH RADIOGRAPHIC RESULTS

DISCUSSION

The (modified) Stoppa technique has been quite well-liked in recent years for the surgical treatment of acetabular fractures. For treating acetabular fractures with anterior column involvement, some people think this intra-pelvic method is a better option than the more common ilioinguinal exposure. ^(13,17)

Recently studies show preliminary results using the Stoppa method to treat pelvic and acetabular fractures, and has virtually replaced ilioinguinal exposure during the past 20 years as our favoured acetabular anterior approach. ⁽¹⁸⁾

The Modified Rives-Stoppa method of treating acetabular fractures is the subject of extensive research. Treatment options for complicated acetabular fractures are numerous and are becoming improved over time. Because complex acetabular fractures require lengthy exposure and can't be reduced using just one method, therapy can be challenging.

Numerous studies have looked at the conservative therapy of complicated acetabular fractures treated with lateral and longitudinal skeletal traction. They emphasise that traction

can be used to achieve congruent reduction. But it's important to emphasise immobility and its consequences.¹⁹

According to Matta The main components of open reduction and fracture treatment, as well as early mobilisation that will preserve joint function, are anatomic reduction, rigid fixation, and internal fixation.²⁰

According to Pennal et al.²¹, when open reduction and internal fixation are performed, The effectiveness of the reduction that was achieved immediately affects the quality of the clinical outcome. For surgeons, difficult surgical exposure, prolonged surgery, and complications present significant challenges, but these issues can be resolved with practise and caution.

The method used to treat displaced acetabular fractures must provide sufficient exposure and cause the least amount of morbidity possible. An ideal strategy would enable easy inspection of both the articular surfaces and columns. Extensile methods have a high rate of problems when used around the hip joint.

According to Alonso et al., a Triradiate approach resulted in a 53% incidence of heterotopic ossification while an extended iliofemoral approach resulted in an 86% incidence. When operating on these patients, we adopted a non-extensile technique.

Stoppa's modified Rives-method is well known for its security and simplicity Because this method does not make use of the neurovascular window, the danger of traction injury to the femoral nerve and vascular bundle is reduced. As the inguinal canal is not breached, the likelihood of complications from an inguinal hernia surgery is reduced. This method offers a clear visualisation of the posterior column and quadrilateral surface. The Corona Mortis is the only structure that required special attention in this method, however, it can be ligated and safely dissected. In our study we never experienced any corona mortis bleeding issues during the course of our trial because it was isolated, ligated, and cauterised in each patient. Another feature that could be found while repairing the quadrilateral surface is the obturator nerve, which needs to be recognised and preprotected.

The median age of the acetabular fracture patients in the current study, which included patients of different ages, was 35.3 years, which is equivalent to Claude's challenging research on acetabular fractures. Because men are more likely than women to be involved in traffic accidents, which is also true in other studies, men predominated in our study group.²²

The fundamental investigations to measure acetabular fractures include an antero-posterior and Judet view of the pelvis, and a CT scan performed prior to joint reduction is helpful in assessing and making decisions about an injured hip.

In 2006, The degree of initial displacement, injuries to the femoral head or superior weight-bearing dome, the level of hip joint instability brought on by a posterior wall fracture, the effectiveness of an open or closed reduction, and late complications like AVN, heterotopic ossification, lysis of the cartilage, or injuries to the nerve were all mentioned by H. J. Kreder as variables that could affect the outcome.

With the exception of two patients, we treated with a single approach in all cases. This was because it was challenging to correct the posterior column fracture through the anterior approach. In the short term, 80% of patients respond satisfactorily to this single strategy.

One case of DVT using an anterior route was described by Swiontkowski²⁴. We also had one DVT instance in our investigation. In posterior methods, Giannoudis²⁵ et al. reported 8% of iatrogenic sciatic nerve palsy; Swiontkowski²⁴ et al. revealed 8.3% iatrogenic sciatic nerve injury while we had one case during posterior approach.

When compared to research by Matta²⁰, Swiontkowski²⁴, and Claude²², the complication rate is relatively low. In our investigation, heterotopic ossification has not yet been observed in any cases. In extensile techniques utilised for complicated fractures, heterotopic ossification was found to reach up to 20%.

In our study we treated patients with¹⁶ indomethacin for six weeks as a preventative measure against heterotopic ossification. Femoral head avascular necrosis has been documented in literature. We had not come across that problem in our research. Although the patient was asymptomatic and had an outstanding clinical outcome, In the anterior approach, we came across a case of intra-articular screw penetration.

The non-extensile technique we examined has shorter operating times and average blood loss that are comparable to those described by other studies, according to several studies that were conducted.

4,24,46,47,51

Numerous investigations on surgery revealed that the two methods were at least similar in terms of procedure time, blood loss, and serious perioperative problems.

Fixation failure, external iliac vein injury, sciatic nerve palsy, and palsies of the obturator and obturator nerves are the modified Stoppa technique's most common side effects. Deep vein thrombosis, inguinal hernias, peritoneal cavity violations, cystotomies, palsies of the lateral femoral cutaneous nerve, damage to the superior gluteal artery, and atrophy of the rectus abdominis muscle have also been reported in cases.^{26,27)}

Our perioperative complication rate was also lower than Letournel's and Merle d'Aubigne trials employing the ilioinguinal technique, which showed complication rates of 20% and 13%, respectively, and included infection, hernia, and neurovascular injury.^(28,29)

Several authors have thoroughly explained the modified Stoppa method in past papers, and the operating surgeons in this investigation used surgical methods and procedures that were exactly the same as those found in these earlier studies.⁽³⁰⁾

Thus it was observed that, An alternative to the ilioinguinal method for fixing anterior acetabulum fractures is the modified stoppa approach, either alone or in combination with other approaches.^(31,32,33,34,35)

According to research comparing the outcomes of the two techniques in the fixing of acetabular fractures, the modified stoppa strategy and the ilioinguinal approach did not significantly differ in terms of reduction quality, imaging follow-up results, clinical outcomes, and complications..^(33,35,36,37)

In the case of an acetabular fracture, larger radiographic results typically yield better outcomes. The secret to a successful course of treatment is restoration of the upper weight-bearing dome of the acetabulum.^(38, 39)

The modified Stoppa method has drawbacks in that posterior column fractures may be difficult to reduce and internally fix while the femoral head, labrum, and articular surface of the acetabulum are impossible to see, leading to insufficient debridement of the joint.

Vikmanis et al., "An approach to posterior column fractures." (40,41)

In the present study, 30 patients with acetabular fractures were managed by surgeons using the newly modified Stoppa technique, and they were observed clinically and radiographically for an average of 6- 18 months. In accordance with earlier studies, we were able to achieve a satisfactory result in acetabular fractures with respect to anatomical reduction and excellent outcome (42,43,44)

A few of the well-documented techniques in the literature are the Kocher-Langenbeck, iliofemoral, ilioinguinal, combined anterior and posterior, extended iliofemoral, transtrochanteric, and triradiate methods. (45,46,47,48,49,50,51,52)

Depending on how much exposure was achieved, these techniques are typically categorised as restricted, extensile, anterior, , depending on the specific region of the acetabulum exposed, can be anterior, intrapelvic, or extrapelvic. (52)

Modified stoppa approach has following advantages: Anatomical dissection is quite simple compared to the ilioinguinal technique, it enables the surgeon to see all anterior parts, especially the quadrilateral plate, more clearly than the traditional ilioinguinal approach, provides direct control over corona mortis, Approaching and visualising the posterior column directly is possible, it allows for the direct and medial placement of a reconstruction plate to the hip joint, allowing for fixation and medial buttressing of the quadrilateral plate—this has not previously been described in the ilioinguinal method.(52)

A team of two skilled pelvic and acetabular surgeons is advised to undertake this surgery since standing on the side opposite the fracture inhibits the capacity of a single surgeon to "see and fix" the fracture from the same position.(52)

CONCLUSION

We were able to obtain satisfactory results in our short-term study using this new, forthcoming technique, which has been widely used around the world since 2010. The use of non-extensive techniques has simplified surgery and decreased complications. With

greater surgical skill and early surgical intervention, we can treat difficult acetabular fractures using this innovative technique for anterior exposure of the acetabulum.

BENEFITS OF THIS APPROACH

- Quadrilateral surfaces are easy to handle because the fracture appears perpendicular to the plane of this technique.
- Possibilities of faster wound healing and avoiding scarring
- Lower likelihood of heterotopic ossifications
- Since this method avoids breaching the inguinal canal, the risk of inguinal hernia is lower

There are drawbacks to this strategy.:

- Articular surfaces are not visible
- It will be challenging to treat some comminuted anterior wall fractures with this method.

According to Matta, any chance to anatomically minimise the pieces, fix tightly, and mobilise early must be taken for improved function. Conservative techniques and the challenges of immobility cannot accomplish this.

Anatomic joint restoration will enhance the patient's quality of life and facilitate any necessary reconstructive procedures in the future, should complications arise.

CASE ILLUSTRATION

CASE 1

NAME : RAVI RATHOD

IP NO : 173562

AGE/SEX : 35yrs/M

OCCUPATION : Electrician

DIAGNOSIS : Anterior column fracture left hip

ASSOCIATED INJURIES : Nil

PROCEDURE DONE : ORIF with recon plate with screw

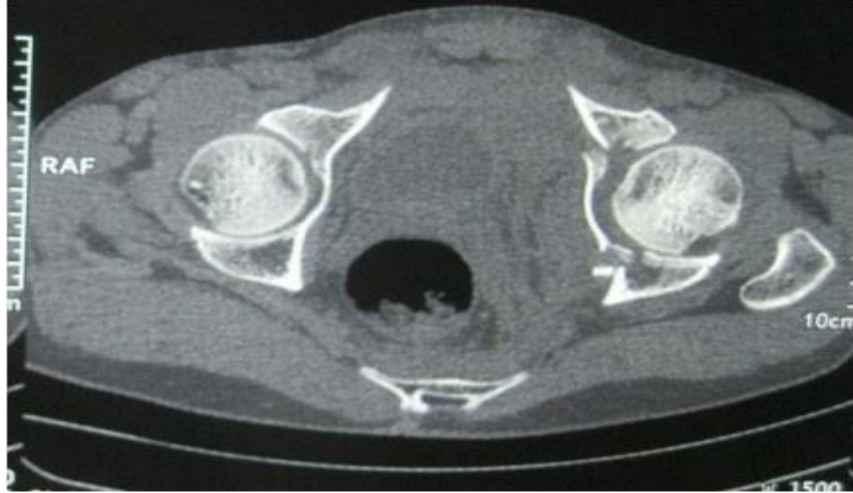
SECONDARY PROCEDURE: Nil

COMPLICATIONS: Nil

TIME DELAY IN SURGERY: 5 days

Pre operative xray





Immediate post operative x-ray



14 months follow up









CASE 2

NAME: SARIT

IP NO: 129486

AGE/SEX: 40yrs/M

OCCUPATION: Rikshaw driver

DIAGNOSIS: Anterior column fracture left hip

ASSOCIATED INJURIES: Nil

PROCEDURE DONE: ORIF with recon plate and screw

SECONDARY PROCEDURE: Nil

COMPLICATIONS: Nil

TIME DELAY IN SURGERY: 5 days

Pre operative xray





Immediate post operative x-rays



18 months follow up







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SHRI B.M. PATIL MEDICAL COLLEGE, HOSPITAL AND RESEARCH
CENTRE,

VIJAYPUR- 586103

PROFORMA

CASE NO. :

NAME :

AGE/SEX :

IP NO :

DATE OF ADMISSION :

DATE OF SURGERY :

DATE OF DISCHARGE :

OCCUPATION :

RESIDENCE :

Presenting complaints with duration :

History of presenting complaints :

Family History :

Personal History :

Past History :

General Physical Examination

Pallor: present/absent

Icterus: present/absent

Clubbing: present/absent

Generalized lymphadenopathy: present/absent

Built: poor/moderate/well

Nourishment: poor/moderate/well

1

Vitals

PR: RR:

BP: TEMP:

Other Systemic Examination:

Local examination:

Inspection:

a) Attitude/ deformity- kyphosis/exaggrated lumbar lordosis

b) Abnormal swelling

- Site

- Size

- Shape

- Extent

d) Skin

Palpation:

a) Local tenderness

b) Bony step

c) Abnormal movement

d) Swelling

Range of movements:

Measurements

General examination –

Upper limbs :

Abdomen :

Lower limbs :

Provisional diagnosis:

Differential diagnosis:

1

Routine & Special investigations(If required):

- HB gm%
- TLC
- DLC
- PLETLETS
- BT CT
- ESR
- RBS
- BLOOD GROUP & Rh TYPING
- URINE ROUTINE
- SR. CREAT
- LFT
- LIPID PROFILE
- HBsAg
- HIV
- HCV
- X RAY CHEST PA VIEW
- X RAY OF INVOLVED BONE WITH FRACTURE OTHERS
- Clinical diagnosis : Selection criteria for the study:
 1. Diagnosis
 2. Clinical assessment (laboratory investigations)
 3. Fitness (medical/ anaesthesia)
 4. Age factor. TREATMENT : Medical – Surgical (type of operation)-Which operation performed :

PROGRESS :

Post op Clinical Assessment:

POST OP

- Check the accuracy of reduction using plain radiograph pelvis with both hips ap view and judet and obturator obliqueview.
- Restrict mobilization to toe-touch weight-bearing for the first threemonth
- Allow for full weight-bearing as tolerated with the assistance of a physiotherapist if fracture consolidation is evident three months postoperatively.⁹

FOLLOW UP

- Duration after surgery: 6 weeks/3 months/6months
- Radiological evaluation – check X-RAYPelvis with both hips.

MODIFIED MERLE D' AUBIGNE SCALE

CRITERIA	Points
PAIN	
None	6
Slight or intermittent	5
After walking but resolves	4
Moderately severe but patients are able to walk	3
Severe, prevents walking	2
WALKING	
Normal	6
No cane but slight limp	5
Long-distance with cane or crutch	4
Limited even with support	3
Very limited	2
Unable to walk	1
RANGE OF MOTION	
95-100%	6
80-94%	5
70-79%	4
60-69%	3
50-59%	2
Less than 50%	1
CLINICAL GRADE	
Excellent	18
Good	15,16, or 17,
Fair	13 to 14
Poor	< 13

B.L.D.E. (DEEMED TO BE UNIVERSITY)

**SHRI B.M.PATIL MEDICAL COLLEGE HOSPITAL AND RESEARCH CENTER, VIJAYAPURA -
586103**

INFORMED CONSENT FOR PARTICIPATION IN DISSERTATION/RESEARCH

I, the undersigned, _____ S/O D/O W/O, aged _____ years, ordinarily resident of _____ hereby state/declare that Dr. Upadhyay Keyurkumar Laxmishankar of Shri. B. M. Patil Medical College Hospital and Research Centre have examined me thoroughly on at _____ (place), and it has been explained to me in my own language that I am suffering from a _____ disease (condition), and this disease/condition mimics the following diseases. Further Dr. UPADHYAY KEYURKUMAR LAXMISHANKAR informed me that he/she is conducting dissertation/research titled "A PROSPECTIVE STUDY OF FUNCTIONAL OUTCOME OF OPEN REDUCTION AND INTERNAL FIXATION OF PELVIS AND ANTERIOR ACETABULAR FRACTURES TREATED THROUGH MODIFIED STOPPA APPROACH.

Under the guidance of Dr. DAYANAND B.B requesting my participation in the study. Apart from routine treatment procedures, the preoperative, operative, postoperative, and follow-up observations will be utilized for the analysis as reference data. The doctor has also informed me that during the conduct of this procedure, adverse results may be encountered. Most of them are treatable but are not anticipated; hence there is a chance of aggravation of my condition, and in rare circumstances, it may prove fatal in spite of anticipated diagnosis and best treatment made available. The Further doctor has informed me that my participation in this study help in the evaluation of the results of the study, which is a useful reference to the treatment of other similar cases in the near future, and also I may be benefited in getting relieved of suffering or cure of the disease I am suffering.

The doctor has also informed me that information given by me, observations made/ photographs/ video graphs taken upon me by the investigator will be kept secret and not assessed by the person other than my legal hirer except for academic purposes, or me.

The doctor did inform me that though my participation is purely voluntary, based on the information given by me, I can ask any clarification during the course of treatment/study related to diagnosis,

the procedure of treatment, the result of treatment, or prognosis. At the same time, I have been informed that I can withdraw from my participation in this study at any time if I want or the investigator can terminate me from the study at any time study but not the procedure of treatment and follow-up unless I request to be discharged.

After understanding the nature of dissertation or research, diagnosis made, mode of treatment, I, the undersigned Shri/Smt, under my fully conscious state of mind, agree to participate in the said research/dissertation.

Signature of the patient:

Signature of doctor:

Witness: 1.

2.

Date:

Place :

SR. NO	PATIENT NAME	IP NO	AGE	SEX	FRACTURE TYPE	FIXATION METHOD	DURATION OF SURGERY (MINS)	APPROACH	FOLLOW UP (Months)	MERLE D SCORE	OUTCOME	RADIOGRAPHIC RESULTS
1	Bhimray	21669	38	M	Superior pubic rami fracture	Plating	100	Modified stop a approach	14	18	EXCELLENT	ANATOMICAL REDUCTION
2	Asif	129473	41	M	Anterior wall fracture	Plating	120	Modified stop a approach	14	15	GOOD	ANATOMICAL REDUCTION
3	Sarit	129486	40	M	Anterior column fracture	Plating+screw	95	Modified stop a approach	18	15	GOOD	ANATOMICAL REDUCTION
4	Govind I angamma	137532	25	M	Anterior wall fracture	Plating + Screw	120	Modified stop a approach	14	18	EXCELLENT	ANATOMICAL REDUCTION
5	Nagraj	142890	36	M	Anterior column fracture	Plating	90	Modified stop a approach	14	16	GOOD	ANATOMICAL REDUCTION
6	Jyoti Nagaraj	145560	45	F	Superior pubic rami fracture	Plating	90	Modified stop a approach	14	12	POOR	POOR REDUCTION
7	Veeresh	153770	23	M	Superior pubic rami fracture	Plating	100	Modified stop a approach	14	18	EXCELLENT	ANATOMICAL REDUCTION

8	Kartik	153565	26	M	Superior pubic rami fracture	Plating	100	Modified stop a approach	14	18	EXCELLENT	ANATOMICAL REDUCTION
9	Ashok	160936	33	M	Anterior wall fracture	Plating	120	Modified stop a approach	14	17	GOOD	ANATOMICAL REDUCTION
10	Pundalik kya	169154	61	M	Anterior column fracture	Plating	90	Modified stop a approach	18	16	GOOD	ANATOMICAL REDUCTION
11	Ravi Rathod	173562	35	M	Anterior column fracture	Plating+screw	95	Modified stop a approach	14	18	EXCELLENT	ANATOMICAL REDUCTION
12	Waseem	175906	40	M	Anterior wall fracture	Plating	130	Modified stop a approach	14	13	FAIR	IMPERFECT REDUCTION
13	Mallikarjun	192624	33	M	Anterior wall fracture	Plating	100	Modified stop a approach	14	17	GOOD	ANATOMICAL REDUCTION
14	Manappa	210000	40	M	Superior pubic rami fracture	Plating	95	Modified stop a approach	14	18	EXCELLENT	ANATOMICAL REDUCTION

15	Guru	218516	50	M	Superior pubic ramus fracture	Plating	100	Modified stop a approach	14	15	GOOD	ANATOMICAL REDUCTION
16	Sangamesh	228016	47	M	Anterior column fracture	Plating	110	Modified stop a approach	14	16	GOOD	ANATOMICAL REDUCTION
17	Ambawwa	245798	46	M	Anterior wall fracture	Plating	90	Modified stop a approach	14	16	GOOD	ANATOMICAL REDUCTION
18	Rajesh Patil	262641	55	M	Superior pubic ramus fracture	Plating	110	Modified stop a approach	18	15	GOOD	ANATOMICAL REDUCTION
19	Ganesh	251899	25	M	Anterior column fracture	Plating	100	Modified stop a approach	14	18	EXCELLENT	ANATOMICAL REDUCTION
20	Naveen Joshi	282599	34	M	Superior pubic ramus fracture	Plating	90	Modified stop a approach	14	15	GOOD	ANATOMICAL REDUCTION
21	Rajkumar	282605	55	M	Anterior column fracture	Plating	95	Modified stop a approach	14	17	GOOD	ANATOMICAL REDUCTION
22	Rayappa	302914	49	M	Anterior wall fracture	Plating	95	Modified stop a approach	14	17	GOOD	ANATOMICAL REDUCTION

23	Ravi	311624	43	M	Anterior column fracture	Plating	95	Modified stop a approach	14	18	EXCELLENT	ANATOMICAL REDUCTION
24	Jakkapps	2138	68	M	Superior pubic rami fracture	Plating	100	Modified stop a approach	14	10	POOR	POOR REDUCTION
25	Gangadhar	11630	32	M	Superior pubic rami fracture	Plating	90	Modified stop a approach	14	18	EXCELLENT	ANATOMICAL REDUCTION
26	Girija	20806	41	F	Anterior column fracture	Plating	90	Modified stop a approach	14	16	GOOD	ANATOMICAL REDUCTION
27	Nagraj	39755	63	M	Superior pubic rami fracture	Plating	100	Modified stop a approach	14	13	FAIR	IMPERFECT REDUCTION
28	Ramesh	48320	62	M	Anterior wall fracture	Plating	120	Modified stop a approach	14	17	GOOD	ANATOMICAL REDUCTION
29	Jagdish	57410	29	M	Anterior column fracture	Plating	90	Modified stop a approach	14	18	EXCELLENT	ANATOMICAL REDUCTION



TEC/NO-09/21
Date- 22-01-2021

B.L.D.E. (DEEMED TO BE UNIVERSITY)

(Declared vide notification No. F.9-37/2007-U-3 (A) Dated: 29.3.2008 of the Ministry, Government of India under Section 3 of the UGC Act, 1956)

The Constituent College

SHRI. B. M. PATIL MEDICAL COLLEGE, HOSPITAL AND RESEARCH CENTRE

INSTITUTIONAL ETHICAL CLEARANCE CERTIFICATE

The Institutional ethical committee of this college met on 11-01-2021 at 11 am to scrutinize the synopsis of Postgraduate students of this college from Ethical Clearance point of view. After scrutiny the following original/corrected and revised version synopsis of the Thesis has been accorded Ethical Clearance

Title: A prospective study of functional outcome of open reduction and internal fixation of pelvis and anterior acetabular fractures treated through modified stoppa approach

Name of PG student: Dr Upadhyay Keyurkumar Laxmishankar Department of Orthopaedics

Name of Guide/Co-investigator : Dr Dayananad B.B, Professor of Orthopaedics

DR. S.V.PATIL

CHAIRMAN, IEC

Institutional Ethical Committee

B.L.D.E (Deemed to be University)

Shri B.M. Patil Medical College,

VIJAYAPUR-586103 (Karnataka)

Following documents were placed before Ethical Committee for Scrutinization:

1. Copy of Synopsis / Research project
2. Copy of informed consent form
3. Any other relevant documents.

