A CADAVERIC STUDY OF ILIOINGUINAL APPROACH FOR ACETABULAR FRACTURES

Anand A*

ABSTRACT
The ilioinguinal anterior approach for surgical stabilization of fractures of the acetabulum is a difficult procedure but gives an excellent view of the entire anterior and posterior columns of acetabulum unlike the posterior approach. Orthopaedic surgeons do not favour this approach for risk of neurovascular injuries. Cadaveric studies of this approach has revealed interesting observations contrary to existing available literature. The findings are discussed in detail in comparison with western literature. The neurovascular structures that will be encountered during the course of the procedure are comparatively lesser in incidence and the approach can be undertaken without any undue complications.

Key words: acetabular fractures, ilioinguinal approach, neurovascular injuries, cadaveric study

INTRODUCTION
In earlier days acetabular fractures used to be very common in the elderly but of late due to high velocity trauma we find that there are increasing incidences of young adults with complex acetabular fractures.

Therefore it is imperative that surgical fixations of acetabular fractures be done to prevent early degeneration of the hip joint and to reduce the morbidity and mobilize the patients for an early return to normal life.

The ilioinguinal approach described by Le tournel in 1960 is a versatile approach to the acetabulum from the anterior aspect which is a very demanding surgical procedure fraught with neurovascular complications. The Campbell’s operative orthopaedics states that a thorough knowledge of surgical anatomy of this area is necessary to avoid disastrous complications when undertaking this approach. Matta J M advises the surgeons to practice this approach on a cadaver and also gain experience by assisting a surgeon familiar with this exposure before undertaking this surgical approach for the first time. Whenever the ilioinguinal approach, either by itself or in combination with a supplementary posterior approach, appears to provide sufficient exposure of a complex fracture (both anterior and posterior column fractures with a large posterior fragment and anterior column plus posterior hemi transverse fracture). Therefore it is very important to have an in depth knowledge of surgical dissection technique and reported variations of surgical anatomy of this area in order to minimize the risk of neurovascular iatrogenic injuries. This study was conducted to highlight the differences in the surgical anatomy if any and to provide certain insights which will help to reduce the risks of iatrogenic neurovascular injuries during surgery. There are various reports in different ethnic groups highlighting these variations. However

*Major. Dr. A. Anand, Assistant Professor of Anatomy, VMKV Medical College, Salem – 636308. Tamilnadu, India. E-mail: einsatzgruppenfuhrer@yahoo.co.in

Website: www.njcms.com
there are no such published variations in people of Indian descent. Hence the present study.

**MATERIALS & METHODS**

**Materials**

The study was based on cadaveric dissection done on 54 embalmed cadavers. The dissections were done on 10 cadavers bilaterally, looking for similarities and dissimilarities between them.

**Methods**

The skin was incised from the tip of the pubic symphysis and extended up to the anterior superior iliac spine and for further exposure the incision was extended till the posterior two thirds of the iliac crest. Attachments of all the muscles of the anterior abdominal wall were detached and elevated. The iliacus muscle was detached and elevated from the iliac crest till the anterior aspect of the sacroiliac joint. The inguinal canal was identified and exposed. The Lateral cutaneous nerve of thigh was identified and isolated. The spermatic cord in case of male cadavers and round ligament of female cadavers was identified and isolated. The attachments of Internal oblique Abdominis and the Transversus Abdominis were detached from the inguinal ligament. The Psoas sheath was identified and detached. The Conjoined Tendon was identified and divided to expose the retropubic space. The Femoral nerve, External iliac vessels along with lymphatics were identified and isolated. Deep dissection was carried out after dividing the iliopsoas and the anterior and posterior columns of the acetabulum were exposed.

The variations which came across during the course of dissection were compared with those available in western literature.

**OBSERVATIONS**

**Corona Mortis**

Over the supra pubic ramus, there exists a communication between the iliac and the obturator vascular systems. Not many anatomical textbooks describe these anastomotic channels in detail. Corona Mortis literally means "Crown of Death" which is source of extensive bleeding while undertaking the ilioinguinal approach and is also a site of vascular injuries during fractures of the pubic ramii.

In this study it was noted that there was presence of corona mortis in 14 specimens and in 03 cadavers it was bilateral which amounted to a mean percentage of 25.92. In Western literature as reported by Teague et al, the mean percentage of corona mortis was 73. It is found that the incidence of corona mortis in people of Indian descent is significantly lower than in western population.

**Anatomical variations of Lateral cutaneous nerve**

The course of the Lateral cutaneous nerve is highly variable. The nerve always emerges medial to the anterior superior iliac spine. It is encountered and frequently injured leading to post surgical complications if sufficient care is not exercised when undertaking the ilioinguinal approach.

In the present study, it was observed that in 2 cadavers, the nerve emerged approximately 17mm and 13mm lateral to the anterior superior iliac spine. In Western literature, as reported by Hospodar et al, the nerve always emerged medial
to the anterior superior iliac spine with a mean of 20 mm. This variation is hitherto unreported.

**Presence of Abnormal Obturator artery**

The Pubic branch of the Obturator artery anastomoses with the pubic branch of the Inferior epigastric artery behind the lacunar ligament in the retropubic space. During surgeries for repair of femoral hernia, to enlarge the femoral canal the lacunar ligament is incised to expand the canal. Occasionally this anastomosis is enlarged; hence it presents itself as an individual artery and is termed as the abnormal obturator artery. When exposing the retropubic space and the anterior column of acetabulum during the ilioinguinal approach, injury to this vessel could be an additional source of haemorrhage.

In the present study, it was observed in 4 specimens, abnormal Obturator artery was present. In Western literature, as reported by *Pick et al.*, there is a considerable variation in the origin of the artery, with a sole epigastric origin percentage of 27. No such anomalous origin was encountered in our dissections and it is quite safe to expose the suprapubic ramus through the ilioinguinal approach.

**CONCLUSION**

The ilioinguinal approach is a surgically demanding procedure. It provides exposure of the entire inner table of the hip bone and an excellent visualization of the entire anterior column of the acetabulum. Various studies have indicated that there is less incidence of heterotrophic bone formation compared to posterior approaches and the morbidity is significantly reduced. Hence surgeons should keep in mind the reported variations and the neurovascular surgical anatomy when planning for an acetabular surgery through the ilioinguinal approach.

**REFERENCES**

7. JBJS 2004 – 3292; Shah NA et al.