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Research Article

SUPRATROCHLEAR FORAMEN-A PHYLOGENIC REMNANT

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ABSTRACT
The lower end of humerus has thin transparent septum separating coronoid and olecranon fossae. This septum sometimes perforates resulting in supratrochlear foramen (or) septal aperture. As it is not a common feature, the humerus with this foramen has an extending degree of movements of elbow joint. The present study was done on 50 humerii from the department of Anatomy, MIMS and Vizianagarum. In the study it was observed that an oval shaped foramen was common than round and predominant on the left sided bones. This knowledge of septal aperture is beneficial to orthopaedicians and radiologists in their clinical practise.

Key Words: *Humerus, Supratrochlear Foramen, Septal Aperture, Supracondylar*

INTRODUCTION
The lower end of humerus has two condyles -capitulum and trochlea.Above these two condyles there are radial and coronoid fossae anteriorly and olecranon fossa posteroirly. The coronoid and olecranon fossae receive the process of ulna in movements of elbow joint. Normally these two fossae are separated from one another by thin plate of bone. Sometimes this bony septum or plate may become perforated resulting in the formation of supratrochlear foramen (STF) or septal aperture (Hirsh, 1927).
Supratrochlear foramen in humerus was first described by Meckel (1825). STF is not present at birth. The bony septum present between the fossa is relatively thick and occasionally it may be absorbed producing the STF which will happen only after 7 years (Hirsh, 1927). Individuals with this variation may overextend their elbow joint (De Wilde *et al.,* 2004). The humerus with coronoid-olecranon septal aperture has narrow medullary canal. This makes retrograde nailing more difficult in supracondylar fractures and increases the chances of iatrogenic fractures of lower end of humerus. Radiologically they simulate a cystic leison. Hence the knowledge of STF is important for the orthopaedicians and radiologist in their clinical practise.

MATERIALS AND METHODS
The present study was conducted on 50 dried adult humerii of unknown sex.The bones had taken from the Department of Anatomy, MIMS, Nellimarla.The bones were studied for STF and its shape.

Observations
Out of 50 humerii studied 10 showed supratrochlear foramen.Of these oval shaped foramen was observed in 7 bones -4 from left side and 3 belongs to right side.Round shaped foramen was observed in 3 bones-2 from left side and another from right side (figure 1).

DISCUSSION
The presence of STF is considered to be atavistic (Hardlika, 1932). Not only in humans had this been observed in most mammalian species with greater prevalence among the old and new apes (Benfer and Tappen, 1968).
According to Mall (1905), Scheuer and Black (2000), Hiramoto (1993) that these apertures are purely mechanical and acquired due to overgrown of olecranon or coronod process allowing an extra degree of movements at the elbow joint. Mays (2008) thought that the perforation is the result of hyperflexion of elbow joint which resorbs the humeral septum when the coronoid process of ulna make contact with it.

Hirsh mentioned that the pressure of olecranon process may decrease the blood supply leading to septal aperture formation. Humerus with septal aperture has a very narrow medullary canal and anterolateral compressed surface at distal end Akpinar *et al.*, (2003).

Figure 1: Showing oval and round shaped supratrochlear foramen

In one humerus the septum is not completely resorbed. So in that bone along with the round foramen a part of septum has been seen (figure 2).

Figure 2: showing partial septum

Literature described three different shapes of supratrochlear foramen-oval, round and triangular (Rakesh kumar Diwan *et al*., 2013). Majority are oval shaped followed by round and triangular.

The septal aperture may be unilateral or bilateral .If unilateral it is more common on the left side, if it is bilateral, a larger aperture will be seen on the left side bone (Waren, 1897; Hirsh, 1927).

In the ancestors, the presence of foramen increases the degree of movements at elbow joint which had been an adaptation to the fuctional needs. This phylogenitically significant feature of supratrochlear foramen is in recession and will eventually disappear in modern man because of limited range of movements at elbow (Hirsh, 1927). As this phylogenetic remnant narrows the intramedullary space of humerus at a higher level, it requires the special attention of orthopaedician while planning for supracondylar fractures of humerus. In the radiographic study, this septal aperture appears as radiolucent area which can be mistaken as osteolytic or cystic leison (De Wilde *et al*., 2004).

In the present study, we observed 7 oval and 3 round shaped supratrochlear foramina. This septal aperture is seen mostly on the left sided bones than right. Triangular foramen is not observed .In one bone, along with round foramen, a thin transparent septum is found.

Conclusion

The present study on supratrochlear foramen of humerus summarises that oval shaped foramen is common than round and mostly seen on left side humerus than right.As this is a phylogenetic remnant which is in a stage of recession due to limited degree of movements of elbow in modern man may require special attention in day to day clinical practice.

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