MORPHOLOGICAL STUDY OF SUPRATROCHLEAR FORAMEN OF HUMERUS
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Abstract:
Background Supratrochlear foramen (STF) is an important variation in the lower end of humerus. The knowledge of the presence of supratrochlear foramen in the humerus is important for preoperative planning and management of supracondylar fractures and the interpretation of the abnormalities in the radiographs. Material and Methods The presence of Supratrochlear foramen was studied in hundred randomised humeri of unknown sex and age from the Institute of Anatomy, Madras Medical College, Chennai, TamilNadu. The topographical anatomy of the STF was studied in detail. Results Out of the 100 humeri studied, Supratrochlear foramen was found in 28 humeri (28 percent). The STF was absent in 72 (72 percent) specimens. The shape of Supratrochlear foramen was oval in 23 humeri, round in 3 humeri and triangular in 2 humeri. The STF was predominantly oval (23 percent) in shape. Most of the bones with absence of STF showed a translucency of Supratrochlear septum. In the absence of Supratrochlear foramen, 24 specimens (24 percent) showed opaque septum and 48 specimens (48 percent) showed translucent septum. Conclusion The anatomical knowledge of STF is beneficial for anthropologists, orthopedic surgeons and radiologists. Keyword: Humerus, Supratrochlear foramen (STF), Translucent septum.

Introduction:
A thin, translucent plate of bone known as Supratrochlear septum varying in thickness from 0.5mm to 1cm separates the olecranon fossa and coronoid fossa of humerus. In some cases this septum becomes perforated to form an aperture known as Supratrochlear aperture or Supratrochlear foramen. It is important for preoperative planning and management of humeral fractures.

Materials and methods:
The present study was conducted in 100 adult dry human humeri (41 right sided and 59 left sided) of unknown sex and age, obtained from the Institute of Anatomy, Madras Medical College, Chennai. Each humerus was observed for presence of STF (Fig 1 and 2). If the STF was present, its shape (Fig 3) was noted and divided into three types (oval, round and triangular). In the absence of foramen, the translucency of the septum between the olecranon fossa and the coronoid fossa was noted by placing the lower end of the humerus against the X-ray lobby (Fig 4 and 5).
To differentiate between the translucent septum and STF in X-ray, translucent septum shows illdefined margin whereas the Supratrochlear foramen shows a well defined margin\(^8\) (Fig 6 and 7).

**Figure 6** Humerus with translucent septum (Postero–anterior view)

Presence of Supratrochlear foramen has been associated with narrow medullary canal\(^4\). (Fig 8 and 9)

**Figure 8** Absence of Supratrochlear foramen

**Results**

**Morphological parameters:**

1. **Presence / Absence of Supratrochlear foramen:**
   - Out of the 100 humeri studied, Supratrochlear foramen was found in 28 (28 percent) humeri. The STF was present in 11 (11 percent) specimens on right side and in 17 (17 percent) specimens on left side. The incidence of STF was greater on the left side (17 percent) as compared to the right side (11 percent). The STF was absent in 72 (72 percent) specimens (42 cases on left side and 30 cases on the right side).

2. **Shape of Supratrochlear foramen:**
   - Supratrochlear foramen was oval in 23 humeri, round in 3 humeri and triangular in 2 humeri. The STF was predominantly oval (23 percent) in shape\(^5\).

3. **Translucency of Supratrochlear septum:**
   - Most of the bones with absence of STF showed a translucency of septum. In the absence of Supratrochlear foramen, 24 specimen (24 percent) showed opaque septum and 48 specimen (48 percent) showed translucent septum. (Of the 48 bones, 32 were of the left side and 16 of the right side).

**Discussion:**

1. In the present study, it is found that out of 100 humeri studied, 28 percent showed the presence of STF. Recent studies by Soubhagya R Nayakkumar et al (2009) and Sharmila Banu et al (2012) showed the incidence of STF 34.5 percent and 30.5 percent respectively which is closer to the findings of the present study.

2. In the present study the incidence of STF was greater on the left side (17 percent) as compared to the right side (11 percent). Soubhagya R Nayakkumar et al (2009) and Sharmila Banu et al (2012) in their study, stated that STF is common on left side which is similar to the present study.

3. In the present study, it is found that 82 percent of specimens showed oval shape\(^5\), STF. Soubhagya R Nayakkumar et al (2009) observed that 91.6 percent were having oval shape which is similar to the present study.

4. In the present study, translucent septum is found in 48 percent. Sejal V Patel et al and Soubhagya R Nayak et al, in their study found 52.55 percent and 56.7 percent respectively.

**Table 1** Showing the comparative data (in percentage) of the presence of Supratrochlear Foramen in humerus.

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Clinical significance:
Prior anatomical knowledge about the presence of STF prevents the misinterpretation of x-rays by radiologists, since the site of Supratrochlear foramen is relatively radiolucent. This can be mistaken for an osteolytic or cystic lesion. Praskevas et al. study that the presence of STF has been associated with narrow medullary canal. Hence the presence of STF is likely to serve as an indicator during intramedullary nailing procedure. If Supratrochlear foramen is present, care should be taken during posterior central arthroscopy to prevent injury to the anterior compartment.

Conclusion
The study focused on Supratrochlear foramen which is an anatomical variation in the distal end of the humerus. The incidence is 28 percent and it is more common on the left side. The anatomical knowledge of STF is beneficial for orthopaedicians and radiologists in day-to-day clinical practice.

Reference
3. Operative technique in orthopaedic surgery –Gerald.Williams and Mathew