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Case Report

SUPRATROCHLEAR FORAMEN OF THE HUMERUS: TWO CASES FROM THE HELLENIC REGION OF MAGNESIA

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ABSTRACT

The supratrochlear foramen (STF) of the distal part of the humerus bone presents a known anatomical skeleton variation. On the other hand the cause for its appearance remains obscure. Its incidence is reported to be from 0% up to 60% among the adults, depending of the population. Results. Our research on dry bone skeletal remains demonstrated a very low incidence of 0.8% in the Magnesia region of the central Greece. Conclusions. STF incidence presents a huge percentage interval depending on the region in study. Due to various interventional procedures performed in the distal part of the humerus clinicians should be aware of this rare anatomical variation.

KEY WORDS: Humerus, Supratrochlear Foramen, Septal Aperture, Magnesia.

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INTRODUCTION

The supratrochlear foramen (STF) is celebrated as a common anatomic variation in the distal end of the humerus in humans. The supratrochlear septum, a thin plate of bone, separates the olecranon and coronoid fossae. In several cases it may be perforated to form a kind of aperture known by a series of names such as intercondylar foramen, olecranon foramen, epitrochlear foramen [1] and septal aperture [2]. Studies note that this thin bony plate is always present until the age of 7 years, an age limit after which it may be absorbed and a STF to be formed [3].

Other studies propose the significance of the T-Box genes family which controls the synthesis of various proteins that are crucial for the development of the limbs and may cause the appearance of such a foramen [4]. Some suggested that the STF may have a hereditary phylogenetic trait with evolutionary significance (genetic theories). Moreover, intermittent pressure of the ulna olecranon or coronoid processes on the septum of the humerus could potentially result a bony resumption with a simultaneously formation of a STF. It may also occur in individuals with weaker, more lighter humeri (mechanical theories) [5]. A STF may have

different shapes. However, it mainly has a round, oval, triangular, rectangular, reniform, sieve-like, irregular and with a translucent septum form [1,6-7]. Its occurrence is related to medullary canal size, being reported that a STF is connected with a small-sized medullary canal [8].

We present 2 cases of STF discovered in adult skeletons in the Magnesia region in Hellenic peninsula (Thessaly, central Greece) [Figure 1].

Fig. 1: The 2 cases: One male femoral bone (top) and one female (bottom), both presenting a septal aperture, lateral-anterior view.

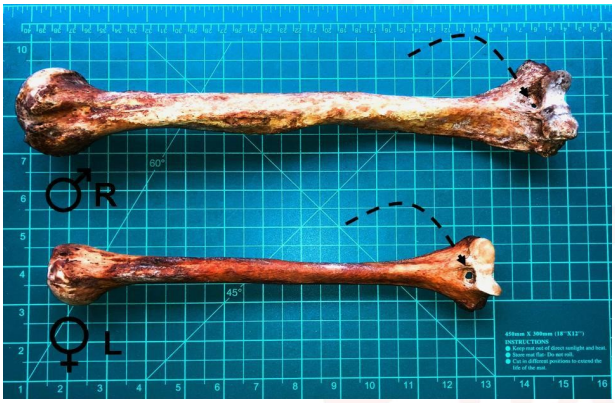


Fig. 2: The male femoral bone: The demarcation of the diameter of both the septal aperture and the coronoid fossa (left side), anterior view.

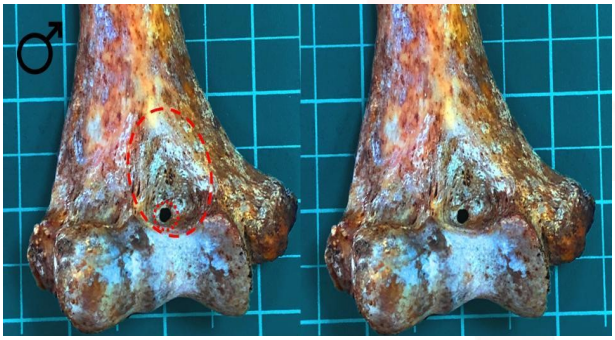
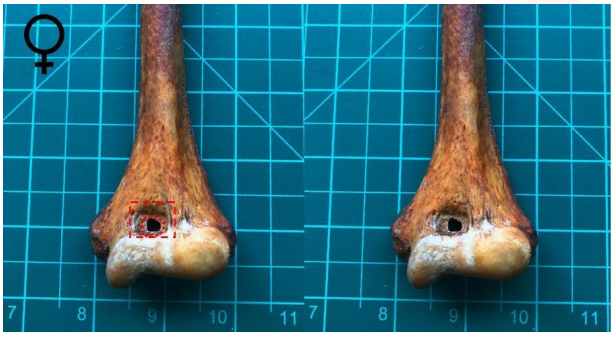


Fig. 3: The female femoral bone: The demarcation of the diameter of the septal aperture and the dimensions of the coronoid fossa (left side), anterior view.



CASE REPORT

Two hundredth and fifty one human skeletons of Caucasian (Hellenic) origin were examined during educational study among the skeletons of 4 major cemeteries of the Magnesia region (Volos, Nees Pagases, Nea Demitriada and Agios Georgios, all now placed in the New Central Municipal Cemetery of Volos) under the licence of the Volos Municipal Authorities.

Our first case concerns a male skeleton of 72 years of age, with a maximum femoral length of 34.5cm, epicondylar breadth of 7.1cm, with a transverse diameter of the coronoid fossa of 11.04cm and cephalocaudal of 7.74cm. The diameter of the roud in shape STF is 4.5mm [Figure 2]. The second humerus bone belongs to a female skeleton of 85 years of age, with a maximum femoral length of 28.25cm, epicondylar breadth of 5.1cm, with a transverse diameter of the coronoid fossa of 8.23cm and cephalocaudal of 6.25cm. The diameter of the irregular-parallelogram in shape STF is 2.6mm [Figure 2]. Among 251 of dry bone pairs of humeri (78 male and 173 female) we have unearthed 2 cases of STF , both unilateral, presenting an total incidence of only 0.8%, 0.4% concerning each side and again 0.4% concerning the sex.

DISCUSSION

The STF presents a variant prevalence from 0% up to 60%. In adult European populations a 5% to 10% is reported, while a higher prevalence up to 60% is noted among some North African and West African groups [5]. Surprisingly, our search discovered a much more lower number. In fact, STF does not qualify by definition as a foramen, a conduit for vessels and nerves. Thus, it should be simply nominated as an aperture, merely an opening in the bone which has been described in human and other primates populations. As STF shows a wide incidence reference among different populations and hence may be used as a parameter in racial identification by the anthropologists [1]. Some studies have reported that the STF is associated with the simultaneous presence of a supracondylar process [9].

Traumatic injuries and pathological fractures, as well as the intermedullary nailing procedures require the detailed knowledge of the distal humeri parts. Additionally the STF is a rather radiolucent area, usually described as “pseudo-lesion” in radiography. Awareness of the shape

and dimensions such as aperture diameter and transverse and vertical distance in which this foramen occurs could prevent a malpractice during interventional surgical procedures and a misinterpretation among radiologists, as it may be presented as a osteolytic or cystic lesion in day-to-day clinical practice [6,10].

CONCLUSION

It seems that the STF was firstly described by Mekel in 1825 [11], making his first appearance in the international medical databases during 1946 by Pomeranz [12]. Although the mechanism for its formation is still obscure, various theories proposed one. Such an aperture, and the authors agree that this is a case of an aperture and not of a foramen, has important clinical significance in medical practise. Our on hand research on dry bones revealed a very low percentage of incidence among the Magnesia population in Greece.

Conflicts of Interests: **None**

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