

A Comprehensive Study on Supratrochlear Foramen of Human Humerus and its Clinical Significance - A Review

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<https://dx.doi.org/10.13005/bpj/2222>

(Received: 10 November 2020; accepted: 26 July 2021)

The lower end of humerus has numerous fossae which play a significant role during extreme movements. Coronoid fossa and olecranon fossa are separated by a delicate supratrochlear septum; occasionally septum has perforation and form an aperture, named as Supratrochlear foramen (STF). The knowledge of this foramen will be beneficial for anatomists, anthropologists, orthopedic surgeons, and radiologists. The aim of the present study was to establish the prevalence and morphometry of STF of the humerus in South Indian population and to correlate with the previous studies. The present prospective study was carried out with 274 (146 left sided + 127 right sided) dried humeri of unknown sex and age. The distal humeri were examined for the presence of STF, morphometry such as diverse shapes, vertical and horizontal diameters, and distance from STF to medial, lateral epicondyle and also to the inferior margin of trochlea using digital vernier caliper. In the present study, out of 274 dried humeri, 69 showed presence of STF, 163 were translucent and 42 were opaque. The prevalence of STF was 25.18%. After keen observation, shapes of the STF were categorized accordingly. The oval (42%) showed higher percentage whereas the other shapes showed as follows: - irregular (12%), round (19%), rectangular (12%), reniform (9.7%), sieve (7.3%) and triangular (2%). The mean vertical and transverse diameters of STF on the right side were 3.12 ± 1.09 and 5.5 ± 1.83 mm and on the left side, it was 3.47 ± 1.32 and 4.9 ± 1.5 mm respectively. The mean distance from STF to medial and lateral epicondyle on the right side was 25.12 ± 3.1 and 28.09 ± 2.3 mm and for the left side 24.97 ± 2.9 mm and 27.16 ± 2.4 mm respectively. The anatomical knowledge regarding the supratrochlear foramen is much promising for the orthopaedic surgeons during intramedullary nailing for supracondylar fracture of humerus. STF appears as a radiolucent area in radiographs, which may pose a difficulty for the radiologist in differentiating it from an osteolytic or cystic lesion. In addition, STF is predominantly found in the primates, it may act an evolutionary link between the humans and lower animals.

Keywords: Anatomist, Anthropologist, Humerus, Intramedullary nailing, Orthopaedicians, Radiologist, Supra-trochlear foramen and Supracondylar fractures.

The supratrochlear foramen (STF) is a significant and relatively atypical anatomical variation noticed in the distal end of humerus and this variation has not been given due significance

in standard textbooks of anatomy and orthopedics. Generally, foramen transmits blood vessels and nerves, in the case of STF, no significant structure is transmitted and in the rare case, there may be a

probability of entry of the median nerve, which may produce symptoms such as pain and weakness in the hand¹. A delicate plate of compact bone known as supratrochlear septum (STS) varying from 0.7 mm to 1.2 cm in thickness, lined by a synovial membrane of the elbow joint, partitioned the ventrally placed coronoid fossae and dorsally placed olecranon fossae. This translucent or opaque septum may consist of enormous perforations and in extreme cases, it may be perforated to form a narrow orifice known as 'supratrochlear orifice' or 'supratrochlear foramen'^{2,3}. The first person to establish the STF was Mekel in 1825 and it was also frequently named as epitrochlear, intercondylar, coronoid, and olecranon foramen^{4,6}. The STF is in various shapes and their morphometry varies in different gender and races. The delicate and translucent STS is not observed in newborn and begins to appear in the latter period of life, persists until the age of seven years and later due to various reasons, STS undergoes degeneration or absorption only in some individuals and may lead to the formation of STF^{7,8}. The presence of STF is not only observed in humans but also in lower animals such as apes, dogs, hyenas, and other primates. The presence of STF in individuals and primates results in hyperextension of the elbow joint during various activities in day to day life^{9,10}. The presence of STF in humans indicates that they are evolved from primates as proved by various theories¹¹. The formation of STF could be due to changes that occur at the molecular level and the gene responsible is T-Box5 (TBX). The genes of these family regulate the genesis of proteins known as TBX proteins, plays a significant role in the genesis of various parts of the upper limb and pumping organ in the womb¹². The STF is considered to be a negligible feature of the humerus in the early days due to unidentified reasons. The supratrochlear fracture is one of the frequently occurring fractures among children¹³. The orthopedic surgeons usually perform a reduction procedure to correct supracondylar fracture through intramedullary nailing, which may be compromised due to the existence of STF. The retrograde intramedullary nailing is done either through the medial and lateral epicondyles of the humerus or only through the lateral epicondyle. Therefore ruling out the presence of STF is of utmost importance before planning the

intramedullary nailing of supracondylar fractures of the humerus¹⁴. During radiological evaluations of the distal end of humerus, the existence of STF may result in spurious interpretation as pathological lesions or cysts¹⁵. Therefore, this study aims to scrutinize the prevalence, incidence, morphology, and morphometry of supratrochlear foramen among the South Indian population. The comprehensive knowledge regarding STF will be worthwhile for anthropologists to trace the evolutionary changes between humans and primates, anatomists while teaching, orthopedic surgeons during pre-operative procedures and radiologists during interpretation.

MATERIALS AND METHODS

This study was carried out after obtaining proper Institutional ethical clearance (SMC/IEC/2020/03/135). A prospective study was carried out on 274 dried humeri from South Indian population including 146 left-sided and 127 right-sided of unknown age, sex and free from bony pathology, obtained from the Department of Anatomy, Saveetha Medical College and Hospital, Thandalam Chennai, India. The study was carried out for 6 months from January to June 2020. The following parameters were observed such as the presence and morphometry of STF. The various morphometric parameters were measured using a digital vernier caliper and the data obtained were analyzed statistically.

RESULTS

The results of this study were narrated in a stepwise manner of various parameters observed in the study.

Presence of STF

Out of 274 dried humeri, STF was observed in 69 bones, among which 32 were noticed on the right side and 37 were on the left side. 42 showed opaque, among which 19 were on right and 23 were on left side and the remaining 163 were translucent septa, in which 65 were on right and 98 were on left side.

Shapes of STF

The shapes of STF are categorized into irregular, oval, round, rectangular, reniform, sieve, and triangular. In the present study almost all shapes were observed. Among all, oval was

Table 1. Prevalence of Supratrochlear foramen in various populations

Author	Population	Prevalence %
Agarwal et al, (2018) ^[31]	North Indians	22.96
Akabori et al, (1934) ^[32]	Koreans	11
Akabori et al, (1934) ^[32]	Ainus	8.8
Akabori et al, (1934) ^[32]	Japenese	18.1
Arunkumar et al, (2015) ^[33]	South Indian	21.4
Abo Sablan et al, (2020) ^[34]	Kurdish	25.81
Ananthi et al, (2011) ^[35]	South Indians	31.3
Benfer et al, (1968) ^[10]	American	6.9
Bashi et al, (2019) ^[36]	Turkey	20.37
Bradshaw et al, (2019) ^[37]	Portuguese	16.18
Bokhari et al, (2018) ^[38]	Lahore	17
Bhanu and Sankar, (2012) ^[3]	South Indians	30.58
Chatterjee, (1968) ^[39]	Eastern Indians	27.4
Chagas et al, (2016) ^[40]	Brazil	22.5
Çimen et al, (2003) ^[41]	Turks	12
Dang et al, (2016) ^[42]	North Indian	30
Deshmukh et al (2018) ^[43]	South Indian	16.3
Diwan et al (2013) ^[25]	North Indian	24.1
Erdogmus et al (2014) ^[17]	Turkish	10.8
Glanville et al, (1967) ^[19]	Africans	47
Glanville et al, (1967) ^[19]	Europeans	6
Hirsh et al, (1927) ^[7]	White Americans	4.2
Hirsh et al, (1927) ^[7]	African Americans	21.7
Hirsh et al, (1927) ^[7]	Native Americans (Arkansas)	58
Hrdlicka et al, (1932) ^[44]	Australians	46.5
Hrdlicka et al, (1932) ^[44]	Italians	9.4
Hrdlicka et al, (1932) ^[44]	Germans	8.8
Jadhav et al, (2015) ^[45]	North Indians	34.68
Jagdish et al, (2017) ^[46]	North Indians	27.3
Joshi et al, (2016) ^[47]	Western Indian	35.88
Kate and Dubey et al, (1970) ^[48]	Central Indians	32
Krishnamurthy et al, (2011) ^[49]	Indians (Telangana)	23
Krishnamurthy et al, (2011) ^[49]	Mexicans	38.7
Krishnamurthy et al, (2011) ^[49]	Eskimos	18.4
Kumar et al, (2015) ^[5]	South Indian	26
Koyun et al, (2011) ^[20]	Turkish	8.6
Li et al, (2015) ^[50]	Jining	10.3
Macalister et al, (1990) ^[29]	Libyans	57
Mathew et al, (2016) ^[27]	Indians (Kerala)	24.59
Ming-Tzu, (1935) ^[51]	Chinese	17.5
Mayuri et al, (2013) ^[52]	North Indians	40.78
Mallikarjun et al, (2020) ^[53]	South Indians	32
Nayak et al, (2009) ^[54]	Indians	34.4
Naqshi et al, (2014) ^[55]	North Indians	27.5
Nodu et al, (2012) ^[6]	South Africans	32.5
Ozturk et al, (2000) ^[56]	Egyptians	7.9
Patel et al, (2013) ^[57]	South Indians	23.5
Papaloucas et al, (2011) ^[58]	Greeks	0.304
Paraskevas et al, (2010) ^[23]	Greeks	11.7
Raghavendra et al, (2014) ^[59]	South Indians	19.2
Ramamurthi (2016) ^[60]	South Indians	23.7
Rao et al, (2018) ^[11]	South Indian	11.7
Singh (1972) ^[24]	North Indians	27.5
Singhal and Rao et al, (2007) ^[11]	South Indians	28
Sathish and suresh (2019) ^[61]	South Indians	19.2
Shivaleela et al, (2016) ^[28]	South Indians	26.7
Sangeetha et al, (2017) ^[62]	North Indians	30.5
Sunday et al, (2014) ^[21]	Nigerian	27.7
Veerapan et al, (2013) ^[63]	South Indians	19.17
Present study	South Indians	25.18

Table 2. Evaluation of various shapes of supratrochlear foramen in correlation with previous literature

Author	Prevalence of various shape of supratrochlear foramen in percentage						
	Irregular	Oval	Round	Reniform	Rectangular	Sieve	Triangular
Arunkumar et al. (2015) [33]		93.42	2.63				3.94
Agrawal et al. (2018) [31]		61.29	32.25				
Bahsi (2019) [36]		32.36	61.93	5.36			
Bokhari et al (2018) [38]	14.7	54.88	14.7			11.76	2.94
Bhanu and Sankar (2012) [3]		70.27	29.72				
Burute et al. (2016) [64]		56.68	16.66				26.66
Diwan et al. (2013) [25]		82.47	10.51				2.33
Deshmukh et al. (2018) [43]		45	50	5			
Dang et al. (2016) [42]		40	60				
Erdogmus et al. (2014) [17]		72.22	11.11			6.5	11.11
Joshi et al. (2016) [47]		65.57	21.31	9.83			3.27
Jadhav and Zambare (2015) [45]	7.79	67.53	16.88				
Jagdish et al. (2017) [46]		36.66	63.33				
Kumar et al. (2015) [2]		78.94	8.77	3.5			3.5
Kumarasamy et al. (2011) [15]		82	18		7.40		7.40
Li et al (2015) [50]		70.37	14.81				6.45
Mayuri et al. (2013) [52]		48.38	41.93			3.22	12.5
Mallikarjun et al. (2020) [53]		43.75	7.81	4.68	18.75	9.35	5
Mathew et al. (2016) [27]		51.6	21.6	11.6	1.6	8.3	
Naqshi et al. (2014) [55]		90.9	9.09				1.49
Nayak et al. (2009) [54]		91.79	5.22				
Öztürk et al. (2000) [56]							
Patel et al. (2013) [57]		93.98	4.51				1.5
Rao et al. (2018) [11]		76.47	11.76			5.88	
Raghavendra et al. (2014) [59]	5.88	85.71	14.28				
Sathish and suresh (2019) [61]		46.70	33.30				20
Singhal and Rao (2007) [11]							
Sunday et al. (2014) [21]		55.55	22.22	11.11			11.11
Shivaleela et al. (2016) [28]	10.53	42.11	47.37				
Savitha and Dakshayami (2016) [14]		28	35.71			21.42	7.14
Veerapan et al. (2013) [63]		42.85	35.71			7.14	14.28
Present study	12	42	19	9.7	8	7.3	2

predominantly observed with 42% and the least was triangular 2%, remaining shapes were 19% round, 9.7% reniform, 8% rectangular, 12% irregular and 7.3% were a sieve. The diverse shapes observed in the study were expressed in figure: 1.

Vertical diameter of STF

The mean and standard deviation of vertical diameter of STF on the right side was 3.12 ± 1.09 and 3.47 ± 1.32 mm on the left side were

Table 3. Evaluation of vertical and transverse diameters of supratrochlear foramen in correlation with previous literature

Author	Vertical diameter of STF		Transverse diameter of STF	
	Right	Left	Right	Left
Arunkumar et al (2015) [33]	3.9 ± 1.32	3.84 ± 1.20	5.67 ± 1.71	5.39 ± 1.57
Agarwal et al, (2018) [31]	4.88 ± 0.69	4.16 ± 0.67	6.35 ± 1.57	6.49 ± 1.37
Bahsi (2019) [36]	4.81 ± 1.38	4.82 ± 1.33	6.55 ± 2.84	5.64 ± 1.96
Bokhari (2018) [38]	3.8 ± 1.24	3.2 ± 1.19	5.2 ± 2.69	4.9 ± 2.75
Bhanu and Sankar, (2012) [3]	5.75 ± 1.5	4.86 ± 1.2	6.68 ± 0.8	6.92 ± 2.0
Chagas et al (2016) [40]	2.778 ± 2.197	2.779 ± 2.050	2.365 ± 1.396	2.332 ± 1.23
Dang et al (2016) [42]	3.79 ± 0.68	3.94 ± 1.40	5.14 ± 1.165	5.21 ± 2.13
Deshmukh et al (2018) [43]	4.2 ± 3.1	4.3 ± 1.7	5.3 ± 2.7	6.7 ± 2.3
Erdogmus et al (2014) [17]	2.72 ± 0.0	4.26 ± 0.0	6.52 ± 0.0	6.7 ± 2.2
Joshi et al (2016) [47]	3.75 ± 1.48	4.68 ± 1.43	5.5 ± 2.89	6.48 ± 2.47
Jagdish et al (2017) [46]	3.77 ± 0.62	3.87 ± 1.40	5.16 ± 1.169	5.20 ± 2.14
Krishnamurthy et al (2011) [49]	4.7 ± 1.69	4 ± 1.52	5.26 ± 2.47	6.5 ± 2.59
Kumar et al (2015) [5]	4.64 ± 2.45	4.76 ± 2.64	5.76 ± 2.22	6.36 ± 2.88
Mathew et al (2016) [27]	3.82 ± 1.07	3.37 ± 1.25	5.24 ± 1.76	4.88 ± 1.63
Mahitha et al (2016) [65]	3.4 ± 1.24	4.2 ± 0.75	4.6 ± 1.76	6.2 ± 2.12
Nayak et al. (2009) [54]	3.81 ± 0.97	4.85 ± 1.64	5.99 ± 1.47	6.55 ± 2.47
Naqshi et al (2015) [55]	3.9 ± 1.32	4.6 ± 1.63	5.3 ± 2.37	6.6 ± 2.53
Patel et al (2013) [57]	4.77 ± 1.15	4.90 ± 1.68	7.31 ± 1.77	7.03 ± 1.49
Raghavendra et al (2014) [59]	3.9 ± 1.4	4.7 ± 1.6	5.1 ± 2.4	6.5 ± 2.5
Rao et al (2018) [11]	5.4 ± 1.52	5.3 ± 2.00	8.1 ± 1.88	7.25 ± 2.78
Ramamurthi KS (2016) [60]	4.3 ± 1.6	4.9 ± 1.5	5.3 ± 2.2	6.8 ± 2.3
Sathish and Suresh (2019) [61]	3.94 ± 1.3	3.82 ± 1.03	5.82 ± 1.52	5.46 ± 2.5
Shivaleela C et al (2016) [28]	3.88 ± 2.39	3.68 ± 3.53	4.50 ± 3.18	3.32 ± 3.22
Sunday et al, (2014) [21]	(3.33 ± 1.04)	5.00 ± 2.40	4.95 ± 1.02	6.82 ± 2.92
Veerappan et al (2013) [63]	4.09 ± 1.13	5.35 ± 1.60	8.30 ± 1.07	7.53 ± 1.28
Present study	3.12 ± 1.09	3.47 ± 1.32	5.45 ± 1.83	4.9 ± 1.51

Table 4. Evaluation of distance from supratrochlear foramen to medial and lateral epicondyles in correlation with previous literature

Author	STF to Medial epicondyle		STF to Lateral epicondyle	
	Right	Left	Right	Left
Bahsi (2019) [36]	25.00 ± 3.07	24.73 ± 3.04	26.19 ± 2.64	26.91 ± 1.97
Bokhari et al (2018) [38]	21.7 ± 0.45	25.3 ± 0.24	27.4 ± 3.0	26.2 ± 2.8
Deshmukh et al (2018) [43]	24.1 ± 2.2	23.7 ± 2.4	16.9 ± 5.5	24.3 ± 2.2
Erdogmus et al (2014) [17]	24.70 ± 1.95	23.93 ± 2.65	26.65 ± 0.68	26.92 ± 1.28
Joshi et al (2016) [47]	24.7 ± 3.3	25.2 ± 3.2	24.7 ± 1.9	25.7 ± 2.7
Mathew et al (2016) [27]	24.91 ± 2.93	24.39 ± 3.15	27.2 ± 2.95	26.92 ± 2.46
Sathish and Suresh (2019) [61]	23.84 ± 2.73		24.06 ± 2.93	
Sunday et al, (2014) [21]	26.30 ± 2.07	25.82 ± 2.75		
Present study	25.12 ± 3.1	24.97 ± 2.9	28.09 ± 2.3	27.16 ± 2.4

observed. Nominal variations were observed when we compare with various shapes.

The transverse diameter of STF

The mean and standard deviation of transverse diameter of STF on the right side was 5.45 ± 1.83 and 4.9 ± 1.51 mm on the left side were observed. Nominal variations were observed when we compare with various shapes.

Distance from Medial epicondyle to STF

The distance was measured from the center of STF to the medial margin of the medial

epicondyle. The mean distance from the medial epicondyle to the center of STF on the right side was 25.12 ± 3.1 mm and on the left side was 24.97 ± 2.9 mm.

Distance from Lateral epicondyle to STF

The distance was measured from the center of STF to the lateral margin of the lateral epicondyle. The mean distance from the lateral epicondyle to the center of STF on the right side was 28.09 ± 2.3 mm and on the left side were 27.16 ± 2.4 mm.

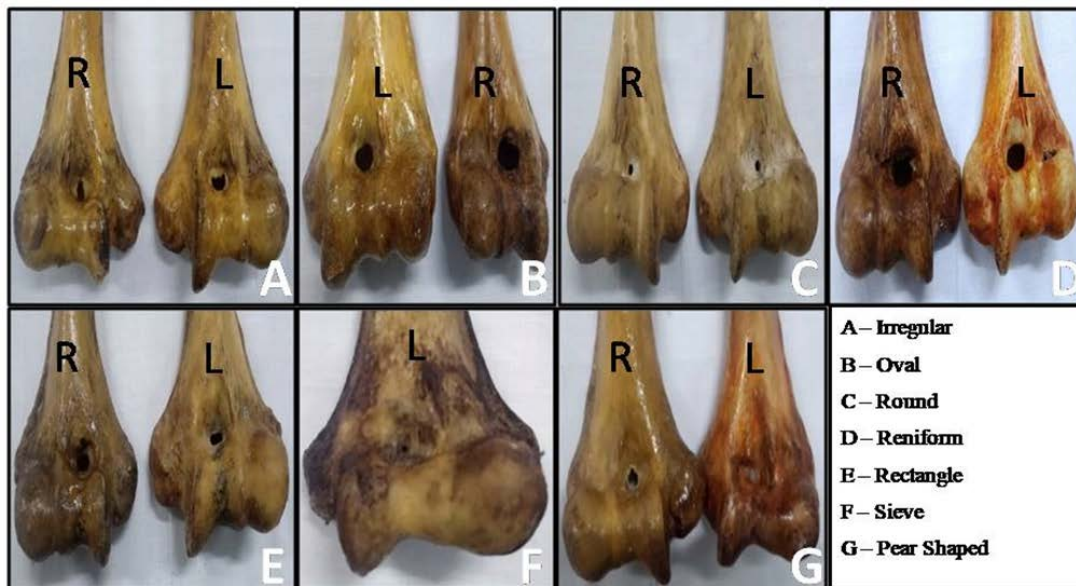


Fig. 1. Diverse shapes of supratrochlear foramen in humerus

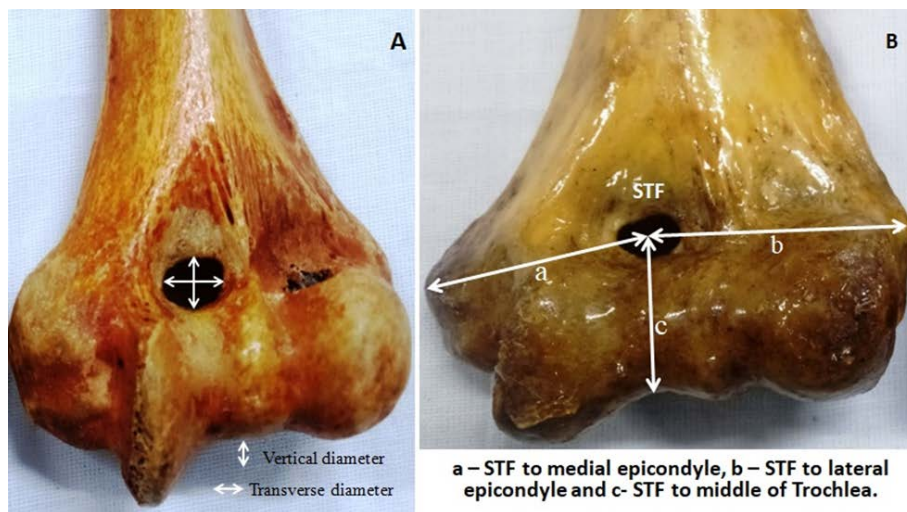


Fig. 2. Various morphometric parameters of supratrochlear foramen

Distance from Trochlea to STF

The distance was measured from the center of STF to the inferior margin of the trochlea. The mean distance from the inferior margin of the trochlea to the center of STF on the right side was 15.07 ± 1.78 mm and on the left side was 14.97 ± 1.62 mm. The various morphometry analyzed in the study were expressed in figure: 2

DISCUSSION

The distal end of the humerus has medial and lateral epicondyles for the origin of flexor and extensor groups of muscles of the forearm. They have three fossae namely the radial fossa, olecranon fossa, and coronoid fossa, and articulate with the radius and ulna to form elbow-joint¹⁶. The lower end of the humerus plays a crucial role in orthopedic treatment during pre-operative planning for supracondylar fracture and also in anthropologists to identify the evolution of humans from the primates^{17, 18}. The bones of humans and lower animals have various foramina for the transmission of neurovascular structures but in case of STF no such significant structure is passing, hence it does not qualify to be one by definition. The STF in lower animals transmitted the brachial artery and median nerve and in a study conducted by Erdogmus S explained that passage of the median nerve produces pain and weakness in the hand.

Theories in the Formation of STF

There are various theories recommended regarding the development of STF both in humans and lower animals.

According to Glanville EV, the STF is formed as a result of articulations between the humerus and ulna during extremes of flexion and extension and mainly comes under mechanical theory. The presence of STF, therefore, can be attributed to the physiological genesis of the elbow joint and its diverse shapes to the morphometry of the articulating surfaces¹⁹.

According to Koyun N, the genesis of STF is mainly due to an inherited trait²⁰.

According to Sunday.OO the prehistoric ancestors were used to undergo cumbersome activities such as cultivation and carrying heavy tools for their basic needs. The intermittent pressure

of processes of the ulna gradually results in the absorption of the STS between them and results in the genesis of STF²¹.

According to Chapman DL, the pressure from the olecranon process may act as a strengthening factor but in the later period of life, the inadequate blood flow to STS results in deterioration and leads to the genesis of STF foramen formation and literature proved that the STS was not present in the embryonic life, but develops after seven years of postnatal life due to reduced blood flow²².

Prevalence of STF

The prevalence of STF varies in different population mainly due to genetic factor and day to day activities they undergo. The formation of STF is predominantly observed in females compared with males²³. Similarly, the STF observation was predominant in the non-dominant left side when compared to the right side. The reason is right side bones are robust and gracile in nature²⁴⁻²⁸. The prevalence of STF in the present study is about 25.18%. The STF prevalence in the human population varies from 0.3% to almost 60% worldwide and is drafted in [Table 1]. According to Macalister, a study conducted among Libyans showed a STF prevalence of 57%²⁹. Prevalence of STS is high among Arkans Indians 52% and low in the Greek population 1%³⁰. There is no obvious cause, the communication noticed between the olecranon and coronoid fossa seems to be an unusual congenital irregularity. Congenital anomalies of bilateral occurrence might reflect the presence of a particular, though very rare genetic defect, since an Online Mendelian Inheritance in Man (OMIM) database search did not divulge any disorder with a clinical evaluation corresponding to lower part of upper extremity communication. Such a congenital anomaly could be due to an enormous growth of olecranon or coronoid process, or it could be pertinent to collagen fibers elasticity leading to flail joints. Flail joints generally hyperextend and may produce erosion of the delicate STS between the fossae.

Lamb et al observed that the prevalence of STF is predominantly observed in the left side compared to the right side especially in ancient people and adolescents³¹. Similarly, in the present study, the prevalence of STS was recognized high

on the left side than the right side. These results were compared with the previous studies and were documented in (Table: 1) many studies.

Morphometry of STF

Shape of STS

The shapes of STF are classified into an irregular, oval, round, rectangular, reniform, sieve, and triangular^{52, 63}. The formation of the diverse shape of STF may depend upon the level of degradation, mechanical activity, and differences in race. As per the literature report, the commonest shape is oval and the least common is a sieve. The remaining shape varies according to different races and depending on the level of absorption. Inconsistent with the previous studies, our studies also showed a higher incidence of oval shape with 52 %, triangular 2 %, round 19% , reniform 9.7%, irregular 10% and 7.3% were a sieve. These results obtained in this study were compared with the previous literature and they were expressed in (Table: 2).

Vertical and transverse diameter of STF

In this study, the mean transverse diameter of the STF was 5.45mm on right side and 4.9 mm, on the left side. Similarly, the mean vertical diameter of STS on the right side was 3.12mm and on the left side, it was 3.47mm. The results obtained in the study were consistent with a study conducted by Vishwajit et al⁴³, Mathew et al²⁷, Nayak et al⁵⁴, Krishnamurthy et al⁴⁹, and Veerappan et al⁶³. The results of the present study were compared with the previous literature and they were expressed in the (Table: 3). The vertical and transverse diameters of the STF varies according to the shape, absorption, and vascular insufficiency of the distal end of the humerus. The perception of these dimensions of STF in the lower end of the humerus may help to reduce the misinterpretation of radiological images.

Distance from center of STS to Medial epicondyle, Lateral epicondyle, and Trochlea

In the present study, the average distance from the center of STF to the medial epicondyle on the right side was 25.12 ± 3.1 mm and on the left side was 24.97 ± 2.9 mm. Similarly, the distance measured from the center of STF to the lateral epicondyle was on the right side 28.09 ± 2.3 mm and on the left side was 27.16 ± 2.4 mm. These results were correlated with previous studies conducted by Li et al⁵⁰, Zahra et al³⁸, Sathish et al⁶¹, Mathew et al²⁷. The data were compared with the

previous reports and revealed in (Table: 4)

The distance from the center of STF to the inferior margin of the trochlea was measured in this study and the mean was 15.07 ± 1.78 mm on right side and on the left side 14.97 ± 1.62 mm. The present study was consistently correlated with Mathew et al²⁷. The knowledge regarding such distances will be very much useful for the surgeons who perform retrograde intramedullary nailing for fractures that occur in the lower end of the humerus and also it will be useful for the radiologist to prevent the misinterpretation of the lower end of the humerus. According to De Wilde et al STF is a relatively radiolucent area, frequently named "Pseudo lesion" in a radiograph of the upper extremity, and can be erroneous as an osteolytic or cystic lesion⁶⁶.

CONCLUSION

The STF is a skeletal variation observed in the distal end of humerus, knowledge regarding this variation will be significant to the anatomists in academics, forensic experts in medicolegal investigations, and anthropologists can use it as a reliable tool to establish a relationship between humans and primates. The presence of STF is important for the orthopedic surgeon for preoperative planning in supracondylar fractures and to choose an ideal intramedullary nail. The radiologist will also find it beneficial during the interpretation of radiographs and CT scans of the lower end of the humerus as it helps in differentiating from an osteolytic or cystic lesion.

ACKNOWLEDGEMENT

I like thank the Professor and head of Department of Anatomy to carry out the research.

Source of support

Self funding

Conflicts of Interest

The authors don't have any conflict of interest.

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