Study of Human Pyramidalis Muscle in Pakistani Population.

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This study was carried out in 120 human subjects in the area of Bahawalpur using cadavers, autopsy specimens and operation theatre observations. Incidence of absence of pyramidalis muscle turned out to be 33.4%, having equal size, shape and attachment of muscle on both sides of the midline. Mostly muscle were pyramid in shape except in one pair where it was quadrilateral. No supernumerary muscle was seen. In view of available literature about this muscle a speculation could be ascertained regarding its regressive nature in the evaluation history, Electromyographic studies of this muscle may establish its present status in reference to functional utility of this muscle with linea alba.
Key words: Pyramidalis Muscle, Pakistan

This rudimentary and vastigeal muscle has not been studied, regarding its structure and function, aggressively. This muscle tenses the linea alba and may be used in muscle transplants, and its repositioning in repair of hernias of inguinal region.

Normally this muscle lies in the lower part of rectus sheath in front of rectus abdominis muscle arising from the front of body of os-pubis and pubic symphysis below the attachment of rectus abdominis and is inserted into the lower part of linea alba, below the umbilicus. It is innervated by the subcostal nerve, normally it is triangular, pyramid in shape.

This muscle has variable morphology, as it is well documented by Anson et al.[1] Present study further supplements the data of pyramidalis muscle from Bahawalpur, Pakistan.

Purpose of study:

Purpose is to know its variable occurrence, size and shape and its attachment in human beings of Pakistani population.

Materials and Methods

This study is based upon the consecutive examinations of 35 cadaveric dissection room specimens and 85 alive subjects undergoing surgery of urinary bladder, uterus and other pelvic organs. A total of 120 cases were studied. The measurement of height was taken from the base of muscle at pubic bone to the tip of the apex of muscle along its medial margin and that of width is taken transversely from the base of pyramidalis at the pubic bone with usual tape measure. Results have been recorded and compared with a data given by Sinha & Kumar[2].(Table I-IV)

Results

Absence of muscle was noted in 40 cases and was present in 80 cases giving incidence of presence of muscle in 66.6% and absence of muscle in 33.4% of our population. Muscle was present bilaterally in all positive cases.

Size:

The length & width of pyramidalis on both sides of the specimens was same i.e the muscles were bilaterally symmetrical. Range of the length was 1.5cm to 12 cm with average of 6.31 cm. And range of width was 0.5cm – 2.5 cm with average of 1.4 cm. (Table-I)

Table I Measurements of pyramidalis muscle in 120 human subjects.

	Minimum	Maximum	Average
Length	1.5 cm	12 cm	6.31 cm
Width	0.5 cm	2.5 cm	1.4 cm

Attachment:

Origin was anterior to the rectus abdominus from the body of pubic bone. Except two cases where origin extended on to the inferior ramus of os-pubis for a distance of about 0.2 cm.

Insertion, in all cases, muscles converged for their attached to the linea alba below the umbilicus.

Course of muscles was almost vertical and in all cases medial margins of the muscles were parallel and close to midline.

Shape:

All muscles were pyramidal in shape with base towards public bone and apex towards umbilicus except in one case, where muscle was quadrilateral. No supernumerary muscle, (existence of two or more muscle on one side) was noted in any case. (Table-II)

Table II. Data of supernumerary muscles cited by Sinha & Kumar[2]

Authors	Comments
Winslow (1776)	There may be two muscle on one side.
LeDouble. (1897)	Two muscle on both sides
Horner (1840)	2, 3 & 4, muscle on one side.
Sinha & Kumar (1985)	Absence of supernumerary muscles on either side.
Present study (1999)	Absence of supernumerary muscle on either side.

Discussion

Incidence of absence of pyramidalis muscle observed by various authors, is different in different studies as shown in (Table –III).

Table III. Absence of pyramidalis muscle observed by various authors (after Sinha & Kumar 1985)

Authors	Absence in%
Schwalbe & pfitzner (1889)	12.7%
Dewigth (1893)	21.0%
LeDouble (1897)	88%
Chudzinski (1898)	00%
Koganei et al. (1903)	3.1%
Adachi (1909)	3.8%
Wagenseil (1909)	1.2%
Nakano (1923)	00%
Vallois (1926)	17.5%
Annel (cited by vallois)	27.2%
Loth (1931)	16.6%
Nakamura (1935)	3.3%
Anson et al (1938)	10.6%
Sinha & Kumar (1985)	5.88 bilateral
Monkhouse (1986)	95%
Present study 1999	33.4%

Our study revealed absence of pyramidalis in 33.4% cases. Except in one, all other studies showed low absence rate as compared to ours, Monkhous & Khalique[3] showed surprisingly high absence rate i.e. 95%, may be it is uncommon in the people of area of Notingham, England. It may be due to some genetic factor. On looking at Table-III, it is clear that there is wide range of variations from 0% to 95% of absence rate of pyramadalis in various part of the world. In our study size was equal on both sides. This is in direct contradiction to the statement of Hallett[4] that one muscle, usually the right, is almost always longer than it's mate. In present study absence rate turned out to be 33.4% with maximum length of 12 cm and minimum length of 1.5 cm. This observation coincides with observation of Anson et al[1] and was having average length of 6.31 cm and maximum width 2.5. cm. Minimum width 0.5 cm., having average width of 1.4 cm. Supernumerary muscles have been seen by some authors but there was no supernumerary muscle in our study. This finding coincides with Sinha & Kumar[2] of India but not with other. This coincidence with Indian study, it may be due to common characters of Indian and Pakistan populations. (Table-II). By comparison with various studies it is evident that there is wide variation of pyramidalis muscle regarding its size (Table-IV), shape & presence of supernumerary muscle in different parts of the world.

Conclusion:

Pyramidalis muscle is absent in 33.4% of Pakistani population and size and shape of the muscle is same on both sides and there is no supernumerary muscle. Average length of muscle is 6.31 cm and average width is 1.4 cm.

Table IV Comparison of data regarding the length & breadth of pyramidalis muscles as observed by various authors.(after Sinha & Kumar[2])

Authors	Length in cm			Width in cm		
	Averg	Max.	Min	Averg	Max	Min
Chudzinski (1898)	6.2	9.2	3.9	2.35	3.7	2.2
Loth (1919)	6.2	13.8	2.0	1.60	3.0	2.0
Vallois (1926)	7.17	10.0	3.0	2.03	-	-
Nakamura (1935)	6.77	10.3	5.7	1.92	3.0	1.0
Auron et al (1938)	6.82	12	1.5	1.98	6.0	0.5
Sinha & Kumar (1985)	6.18	9.9	3.0	1.61	2.5	1.0
Present Study	6.31	12	1.5	1.40	2.5	0.5

Refernces

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