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Case Report

Panniculus Carnosus of the Abdomen - A Rare Presentation

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ABSTRACT

Panniculus carnosus of the Abdomen is a very rare presentation in human beings and not reported in any literature in past. Here is a report of the dissection of a 55 year old male cadaver where this incidental finding was noted and described. Importance of the knowledge of the presence of such rare muscle by clinicians for their therapeutic interventions, the probable embryological and molecular are all discussed.

Key words: - Panniculus Carnosus; Somites; Branchial Arch; Hernia; Flap Reconstruction.

INTRODUCTION

The panniculus carnosus [1] is a part of the subcutaneous tissues which is a layer of striated muscle deep to the panniculus adiposus. In humans the platysma muscle of the neck, palmaris brevis in the hand, and the dartos muscle in the scrotum are described as a discrete muscle of the panniculus carnosus. Some of the muscles of facial expression in the head are part of the panniculus carnosus. In other parts of the body, the layer is vestigial, and may be absent or may exist only as microscopic, disconnected fibres. [2, 3]

In other animals, the panniculus carnosus is more extensive. A grazing animal may twitch the panniculus carnosus to frustrate the attempts of a bird to perch on its back. This is known as twitching the withers. For another example, the panniculus carnosus in the echidna covers almost its entire body, enabling it to change its shape to a certain degree, most characteristically by rolling into a ball and presenting its spines to a potential predator. [3]

Cases have been reported about the presence of Rectus Sternalis muscle in humans [2] but no literature is available until now about panniculus carnosus abdominis.

MATERIALS AND METHODS

During routine abdominal dissection of a 55 year old cadaver for the undergraduate students, after the skin and superficial fascia of the anterior abdominal wall were reflected, there was a thin sheet of striated muscle fibers which was present embedded in deep fascia. This layer was discrete and could be easily separated from

the external oblique muscles of both the sides. Finer dissection was done to remove the excess fat and the fascio-muscular planes were well delineated by describing the muscles fibers with its nerve supply (See Fig. 1 and Fig. 2).

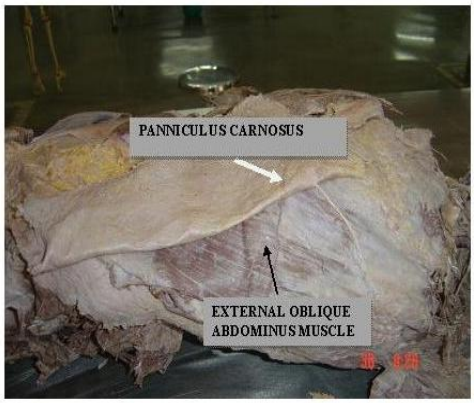

Fig. 1:- Shows the Left Panniculus carnosus which is reflected medially (as indicated in white arrow). Also seen is the left External Oblique Abdominus muscle.

The muscle fibres extended superiorly from the subcostal margins, laterally extended upto the anterior axillary line and inferior extended up to the suprapubic region where the fibres merged with the surrounding fascia was further not delineable, medially the muscle fibres were traceable till the rectus sheath . A single nerve was seen piercing the upper part of the left panniculus carnosus. (See Fig. 2)

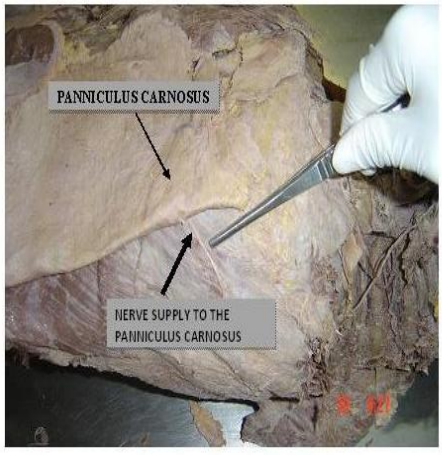

Fig. 2:- Nerve supply to Left Panniculus Carnosus muscle (as indicated in thick black arrow)

DISCUSSION

Studies have reported the presence of rectus sternalis muscle in human beings but no literature is available till date which has reported the presence of such an extensive sub cutaneous muscular sheath on the anterior abdominal wall. Panniculus Carnosus of the abdomen are well described in lower animals where they are functional. The disappearance of this muscle in human beings points towards the evolutionary changes that take place from a lower animal to a biped man. [2]

Though not present in all the human beings, it is a must for the clinicians to have a good knowledge of the morphology of this muscle for the following reasons:-

1) Presence of such a sub-cutaneous muscle along with the other abdominal muscles adds onto the strength and integrity of the anterior abdominal wall. Hypotonia of this muscle may contribute towards the pathogenesis of ventral hernias of the abdominal wall.

2) Knowledge of the direction and extent of muscle will help the Surgical Gastroenterologists for further plan of action en surgery so as to minimize the post operative abdominal muscular weakness.

3) Will help the Plastic and Reconstructive Surgeons in procedures like muscle grafting, myo-cutaneous flap reconstruction post mastectomy.

Probable embryologic & molecular basis

Muscles of the abdominal wall are derived from somites [4] which arise from Lateral Plate Mesoderm (LPM). The cells from the Somatopleuric Mesoderm (SPM) at the abdominal level delineate individually. The mesenchymal cells which become committed to differentiate into future myoctes are initially impregnated within the myodermatomal complex [5] and extend ventrally into SPM. En process of ventral extension of this myodermatomal complex, the continuous interaction which occurs

between the SPM and LPM results in differentiation of the complex into the skin on the abdominal wall with its nerve supply, superficial and deep fascia and the abdominal musculature. [6-8]

During the period of organogenesis in a fetus, the molecular interactions between the somites and the SPM differ at each axial level and hence it results in differential growth and development of muscles at various axial levels. Mice studies have reported the presence of a growth factor Pitx2 and Pitx2 dependent T- box genes [8-12] which are responsible for the development of first Branchial Arch, its derivatives and abdominal wall musculature. Decreased expression of Pitx2 may result in defective development of the ventral abdominal wall and excess of Pitx2 may be responsible for the incomplete differentiation of the complex hence explaining the presence of muscle fibres embedded in subcutaneous tissue seen discretely or as a thin sheet. [13]

This can be confirmed by subjecting a sample of the muscle tissue to genetic studies.

CONCLUSION

A good anatomical knowledge regarding such a muscle is essential for the clinicians to understand the integrity of the abdominal wall with respect to its dynamics in pathogenesis of ventral hernias and to plan for proper surgical interventions which can correct the same and also for Plastic Surgeons as a graft for myo-cutaneous flap reconstructive surgeries.

Competing interests

Authors declare that they have no competing interests with one another.

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