

Anatomy, Abdomen and Pelvis, Camper Fascia

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Introduction

Camper's fascia is the superficial fatty layer of the anterior abdominal wall. This fascia is composed of loose areolar tissue. Magnetic resonance imaging shows a 3-dimensional architecture of fibrous septae that functions to provide support to the adipose tissue. This fatty layer is found deep in the skin and superficial to Scarpa's fascia. Camper's fascia spans from the xiphoid process, laterally to the seventh and 10th costal margins and inferiorly to the inguinal ligament bilaterally. It continues inferiorly past the inguinal ligament as the subcutaneous fat of the thigh. Medially, the fascia extends past the pubic symphysis, combining with Scarpa's fascia to form the dartos tunic of the scrotum in males and the fatty tissue of the mons pubis and labia majora in females. Camper's fascia is important to understand due to its function, its location in surgery, and the role it plays in healing to form a strong barrier over the abdomen.[1]
[2]

Structure and Function

Camper's fascia serves as a protector and an insulator to the deep, vital organs of the abdomen. The function of the fatty layer is to absorb impact and dissipate forces across a large surface area in order to reduce the amount of impact that is transmitted internally. The adipose tissue also acts as insulation to help maintain a constant temperature within the abdomen. Its thickness varies depending on one's body habitus.

As a part of the fascial layers of the abdomen, Camper's fascia serves an important role by separating the skin from the muscles. In the skin, there are nerve endings that contribute to touch, proprioception, and pain. Muscular nerve endings are responsible for muscle contraction and tone. If the fascial plane is broken, new nerve connections can form and cause undesirable outcomes.[3]

Embryology

Camper's fascia originates from the mesoderm. The mesoderm also forms bones, muscles, other connective tissues of the skin, some organs, including the heart, the urogenital system, and blood cells. Specifically, it is the dorsal mesoderm that forms sclerotomes (skeleton), myotomes (skeletal muscles and appendage buds), and dermatomes. The dermatome derivatives contribute to the connective layers of the skin that result in the formation of Camper's fascia.

Blood Supply and Lymphatics

The anterior and lateral aspects of the abdomen are supplied by the superior and inferior epigastric arteries, vertically, and lateral segmental arteries are branching from the intercostal and lumbar arteries, horizontally. These superficial abdominal vessels are found deep to the Camper's fascia and superficial to the Scarpa's fascia. This marks an important landmark for surgery, as to avoid damaging the vessels and lymphatics running through this area.

Nerves

The iliohypogastric, ilioinguinal, and lower intercostal nerves supply motor control and sensory feedback to the abdominal wall. The seventh, eighth and ninth intercostal nerves supply the supraumbilical part of the rectus abdominis and the epigastric skin. The 10th intercostal nerve supplies skin sensation at the level of the umbilicus and motor innervation extending inferiorly to the level of the anterior superior iliac spine. The 11th intercostal nerve supplies sensation below the umbilicus to the level of the inguinal ligament. Finally, the 12th intercostal nerve supplies sensation to the skin, extending inferiorly to the skin above the groin. All of these nerves have to pass through Camper's fascia in order to innervate the skin. Edema of the skin can cause sensation disturbances due to the nerve endings being stretched in the fascial layers of the skin.

Muscles

The muscles of the abdominal wall, externally to internally, are the external oblique muscle, internal oblique muscle, transversalis muscle, and the rectus abdominis muscle. They are all found deep in the Camper's and Scarpa's fascia. Both layers of fascia are important in separating the muscular layers from the integument.

Physiologic Variants

Depending on the location of the Camper's fascia, there are variations in the depth and consistency of tissue. Over the lower abdomen, it is thicker. Some areas of the tissue have more membranous intersections within the fatty fascia, which increases the appearance of dimples in the occasion of heavy edemata, such as with cellulitis.

Surgical Considerations

The abdominal fascia layers are essential considerations when it comes to surgery of the abdomen. Care must be taken to avoid important structures running within the fascial planes. Closure of the fascia is important to prevent dehiscence and the creation of possible sites of herniation and seromas. There are two main types of closures: mass closure with skin closure or individual fascial closure with skin closure. The mass closure is associated with fewer recurrences of herniations and seroma formation due to the closure of the space between the Camper's and Scarpa's fascia. Individual fascia closure runs the risk of creating a space between the layers, leading to the increased potential of a seroma and dehiscence. It is recommended to use a continuous suture with slowly absorbable sutures to decrease the incidence of herniation. [4][5]

Clinical Significance

Camper's fascia provides strength and insulation to the abdominal wall. Below are clinical circumstances that demonstrate the importance of this layer of skin.

Camper's fascia provides moderate strength to the abdominal wall and may be a site of hernia formation if there is a defect. The fascia provides enough support to prevent vertical extension of a hernia.

With such a high-fat content, there have been isolated reports of panniculitis originating within the fascia.

In severe burns to the abdomen, the skin is infiltrated completely, damaging Camper's fascia. This leads to increased fluid loss. The fat content of Camper's fascia serves to prevent water loss through the skin. Without that fatty layer, severe hypovolemia is more likely to occur.

As mentioned above, nerves can be negatively affected if the fascial plane is interrupted. With the interruption, there is communication between the sensory nerves of the skin and the motor nerves of the abdominal muscles. This can lead to miscommunication. Motor signals can cause cross-talk with the skin and vice-versa. This puts into importance

the aligning of the fascial planes upon surgical closure.

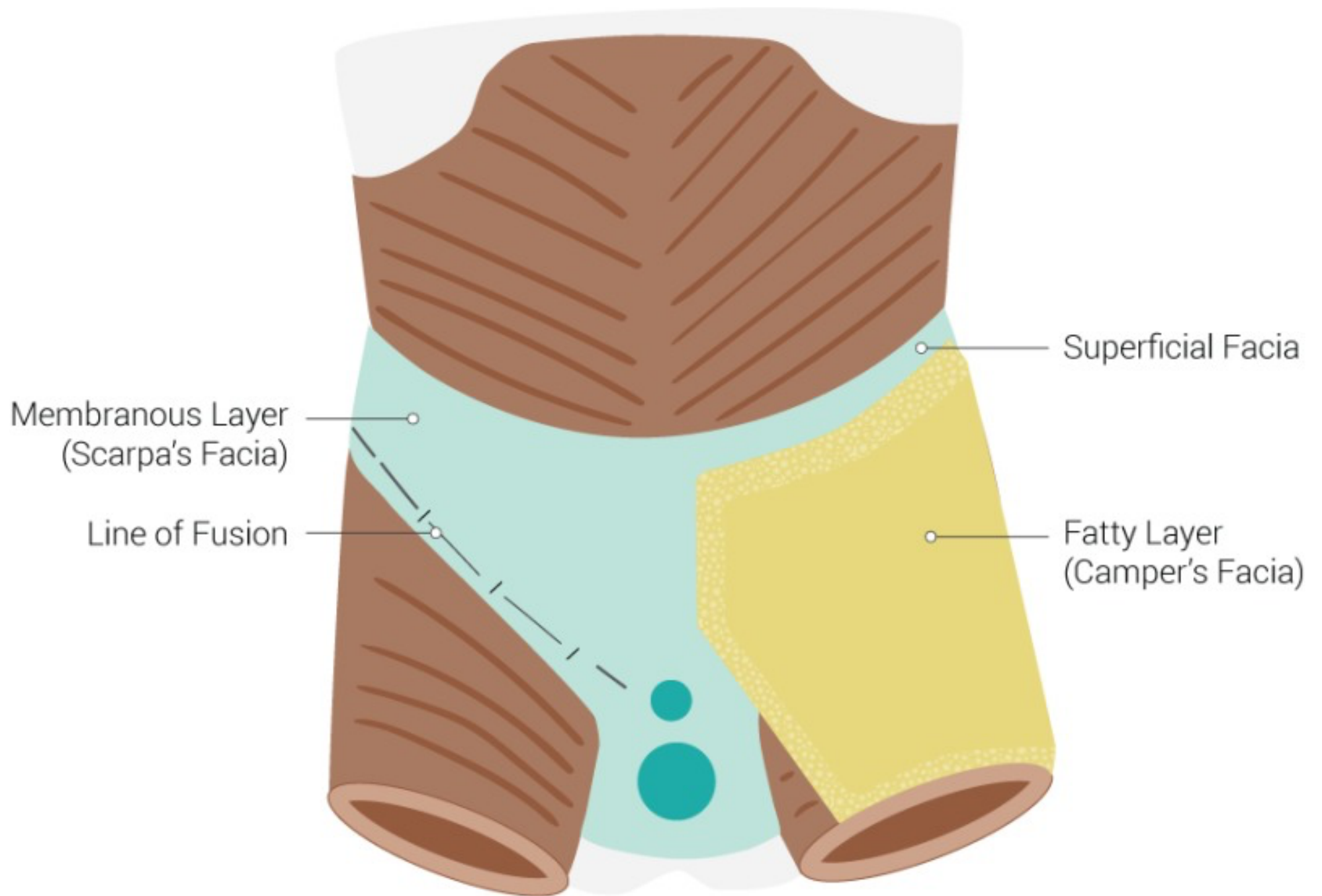
Scars can also form within the fascia after penetrating or blunt trauma. Trauma forms scar tissue that can adhere the fascia to other tissue in the adjacent area. This can lead to pain in the area and can be felt as knots or deficits of tissue under the surface of the skin.

Questions

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References

1. Pechevy L, Gourari A, Carloni R, Sauvaget F, Bertheuil N, Goga D. Monsplasty after massive weight loss: Assessment of its aesthetic and functional impact. *Ann Chir Plast Esthet*. 2016 Feb;61(1):e21-35. [PubMed: 25572166]
2. Mian A, Bertino F, Shipley E, Shoja MM, Tubbs RS, Loukas M. Petrus Camper: A history and overview of the clinical importance of Camper's fascia in surgical anatomy. *Clin Anat*. 2014 May;27(4):537-44. [PubMed: 23553924]
3. Manci N, Marchetti C, Esposito F, De Falco C, Bellati F, Giorgini M, Angioli R, Panici PB. Inguinofemoral lymphadenectomy: randomized trial comparing inguinal skin access above or below the inguinal ligament. *Ann. Surg. Oncol*. 2009 Mar;16(3):721-8. [PubMed: 19104900]
4. Naumann RW, Hauth JC, Owen J, Hodgkins PM, Lincoln T. Subcutaneous tissue approximation in relation to wound disruption after cesarean delivery in obese women. *Obstet Gynecol*. 1995 Mar;85(3):412-6. [PubMed: 7862382]
5. Del Valle GO, Combs P, Qualls C, Curet LB. Does closure of Camper fascia reduce the incidence of post-cesarean superficial wound disruption? *Obstet Gynecol*. 1992 Dec;80(6):1013-6. [PubMed: 1448244]



Fascial Layers, Superficial Fascia, Fatty Layer (Camper's Fascia), Line of Fusion, Membranous Layer (Scarpa's Fascia). Contributed Illustration by Beckie Palmer

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