



ORIGINAL RESEARCH PAPER

Radiodiagnosis

CASE SERIES : ROLE OF COMPUTED TOMOGRAPHY IN EVALUATION OF RECTUS SHEATH HEMATOMAS AND DESMOID TUMOR.

KEY WORDS: Rectus sheath masses, CT, hematomas, Desmoid tumor.

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ABSTRACT

Masses involving the rectus sheath are common in clinical practice and have many etiologies, including hematomas, tumors and tumor-like lesions. Medical imaging is valuable for discovering, diagnosing, and evaluating the extent of rectus sheath masses. With the increasing application of computed tomography (CT), determining a diagnosis or narrowing the differential diagnosis is often possible, thus facilitating effective management. In this article, we comprehensively review the spectrum of common rectus sheath masses which include rectus sheath hematoma and desmoid tumor and present the CT features of typical cases in our hospital. A systematic stepwise diagnostic approach is also proposed for clinical practice.

INTRODUCTION

Rectus sheath hematoma (RSH) is a relatively rare clinical condition, resulting from bleeding into the rectus sheath, after damage to the epigastric arteries or by direct muscular tear. It has been strongly associated with blunt abdominal trauma and anticoagulation, and several more, less common, predisposing factors [1].

It has been well documented over the years since the first report, but still seems to be often misdiagnosed [2]. Although it accounts only for less than 2% of patients presenting with acute abdominal pain [3], every physician in the field of primary and emergency medicine must be familiar with it, as in some cases it can lead to unnecessary laparotomy or even death.

Desmoid tumors, also called deep or aggressive fibromatosis, are uncommon mesenchymal neoplasms with a fibrotic bandlike consistency [4]. These are locally aggressive tumors without potential for distant metastases. Local recurrence and adjacent organ involvement are important causes of morbidity and mortality. The incidence of desmoid tumors in the general population is 2–4 cases per million per year, with a slight female preponderance and peak incidence in the third and fourth decades [5].

Desmoids present as a firm mass, particularly when extraabdominal. The firm consistency can make penetration of tumor difficult during imaging-guided biopsy [6]. Desmoids have spiculated infiltrative margins and are typically adherent to adjacent structures. Microscopically, they consist of poorly defined fascicles of uniform spindle cells and fibroblasts in dense collagen stroma. Mitotic activity is low, and necrosis is rare [6].

CASE SERIES

CASE 1

A 63 year old male who was diagnosed with COVID 19 infection with raised D-Dimer levels. Patient had a history of couple of laparotomy surgeries for intestinal obstruction in the past 10 years ago. On 6th day of LMWH therapy the patient presented with abdominal pain for which a USG was done. USG local part revealed a large heterogeneously hypoechoic lesion with a hypoechoic collection within showing mild peripheral vascularity.

On CT abdomen plain and contrast evaluation revealed a large heterogeneously hypodense non-enhancing lesion showing blood attenuation areas of various stages with intraabdominal extension into the right inguinal region (fig 1A, IB). On arterial study right inferior epigastric artery is seen traversing through the lesion eventually draining into the right iliac artery (Fig 1C, 1D).

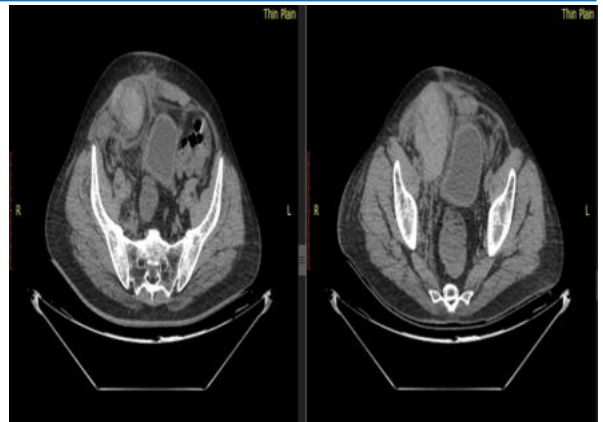


Fig 1A, IB, Axial image of thin plain abdomen reveals large heterogeneously hypodense non-enhancing lesion showing blood attenuation areas of various stages with intraabdominal extension into the right inguinal region. The lesion is pushing the urinary bladder posteriorly and medially.



Fig 1C, 1D axial and coronal images of thin arterial study reveals right inferior epigastric artery is seen traversing through the lesion eventually draining into the right iliac artery (Fig 1C, 1D).

CASE 2

A 46 year old male recently diagnosed with DM and COVID 19 infection with raised D-dimer level on LMWH therapy presented with left abdominal swelling. On examination in the fever OPD, the resident surgeon revealed a fluid attenuation tender swelling which was gradually increased in size in a span of 5 days.

On CT abdomen plain images a large heterogeneously hypodense lesion is seen in the left inguinal region which was seen superior to the left rectus muscle showing blood attenuation (Fig 2A). On thin arterial phase images an inferior epigastric vessel is seen traversing peripheral to the lesion arising from the left iliac artery (Fig 2B).

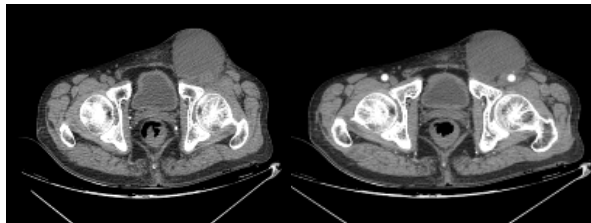


FIG2A, 2B: A large heterogeneously hypodense lesion is seen in the left inguinal region which was seen superior to the left rectus muscle showing blood attenuation. On thin arterial phase images an inferior epigastric vessel is seen traversing peripheral to the lesion arising from the left iliac artery.

CASE 3

A 28 year women presented with a small left paraumbilical swelling which is insidious in onset. On local examination the swelling is ill defined in nature, tender and immobile. Surgery resident was suspecting either a spigelian hernia / infected lipoma at this point of time. On CT abdomen examination revealed a tiny soft tissue lesion within the left rectus sheath muscle belly.

On contrast the lesion shows indeterminate arterial enhancement (FIG 3). Radiological diagnosis was made a benign etiological lesion likely hematoma vs desmoid tumor was made.

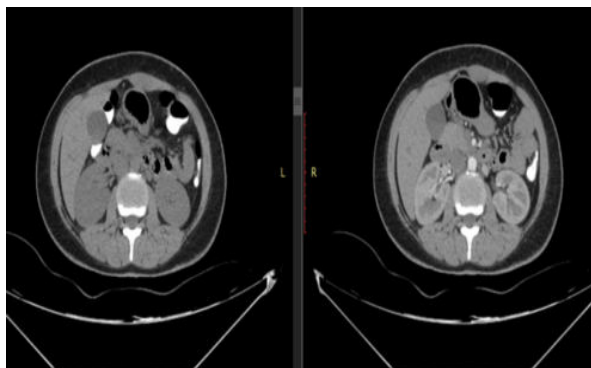


FIG 3: Tiny soft tissue lesion within the left rectus sheath muscle belly. On contrast the lesion shows indeterminate enhancement.

CASE 4

A 25 years old male presented with pain and swelling in the suprapubic region since 10 days. On local examination, there is a hard diffuse tender swelling in the supra pubic region since 10 days.

CT abdomen examination reveal a non enhancing hypodense lesion / area is seen involving the rectus abdominis muscle at the level of iliac blade predominantly the right side. On arterial phase of study the right iliac artery is seen close proximity to the lesion (FIG 4)

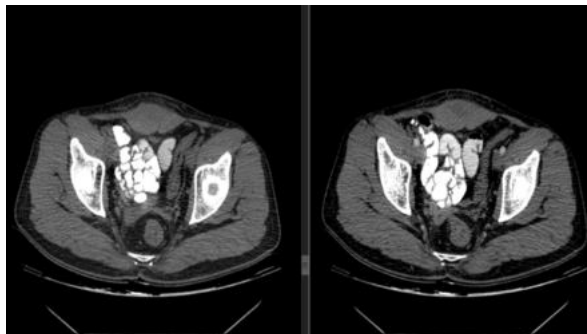


FIG 4 : A non enhancing hypodense lesion / area is seen involving the rectus abdominis muscle at the level of iliac blade predominantly the right side with right iliac artery seen close proximity to the lesion.

DISCUSSION

RSH is a rare condition caused by bleeding into the rectus abdominis muscles; it represents the cause of acute abdominal pain in less than 2% of the cases [7]. RSH development is due to the rupture of the epigastric arteries or caused by direct abdominal trauma or excessively forceful contraction of the rectus abdominis.

RSH denotes a collection of blood in the rectus sheath secondary to disruption of blood vessels coursing through it or injury to the muscle itself. Blunt or penetrating trauma, surgical trauma, pregnancy, collagen vascular disorders, degenerative muscle diseases, blood dyscrasias and strenuous exercise are known predisposing factors. RSH occurring in patients without antecedent history of trauma is referred to as spontaneous RSH. It is more frequent in females and the elderly [8]. Unnoticed trauma, such as straining during defecation or cough, is one of the proposed etiologies for spontaneous RSH. The precise incidence and temporal trends of RSH are not known; however, we believe that the increased use of anticoagulant and antiplatelet therapies is a potential reason for the increased reporting of spontaneous RSH. The high frequency of anticoagulant use and absence of overt trauma in a recently reported series of RSH lend support to this premise. [8]

RSH above the arcuate line is generally caused by damage to the superior epigastric artery. Patients present with a unilateral, small and spindle-shaped mass. It is usually self-limited because the hematoma is tamponaded between the rectus sheath and the tendinous inscriptions of the rectus muscles. Hematomas below the arcuate line are caused by damage to the inferior epigastric artery. They bleed more profusely, dissect the tissue planes extensively and often extend across the midline. This is due to the absence of a tendinous posterior sheath wall in this area. Here, the rectus abdominis muscle is supported only by the transversalis fascia and the parietal peritoneum. Extension into pelvic cavity may not be noticed leading to frequent underestimation of the blood loss [9].

RSH can be classified into three subtypes based on CT appearance Generally, abdominal wall desmoid tumors arise from Musculo-aponeurotic structures of the abdominal wall, especially the rectus and internal oblique muscles and their fascial coverings. Occasionally, desmoids may cross the midline to involve both rectus muscles. Less commonly, they originate from the external oblique muscle and the transversalis muscle or fascia. Extension to the inner surface of the iliac crest and into the abdominal cavity occurs occasionally. Typically, these tumors occur in young, gravid women or more frequently during the first year after childbirth. They may also arise in areas of previous abdominal surgery. Most of the abdominal wall desmoids measure 5-15 cm in diameter. When they arise in the rectus muscle, they

usually remain at their site of origin; that is, they do not cross the midline of the abdomen. Recurrence is 20%-30% and usually becomes evident within 6 months after excision or in connection with subsequent gestations or deliveries [10].

Grade	Anatomic extension	Symptoms	Management
I	Intramuscular, unilateral, does not dissect along fascial planes.	Mild to moderate pain. No drop in hemoglobin.	Conservative; usually outpatient follow up only.
II	Bilateral, some dissection between the muscle and transversalis fascia; no extension into the prevesical space.	Minor drop in hemoglobin.	Observation, short hospital stay. May need transfusion.
III	Bilateral, large, dissects between the transversalis fascia and muscle into the peritoneum and prevesical space.	Significant drop in hemoglobin and hemodynamic instability.	Reversal of anticoagulants and blood transfusion. Angiographic interventions may be needed.

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