

Emergency presentation of a dermoid cyst of the groin: a diagnostic confounder on the acute surgical take

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Abstract: Tender groin lumps are common emergency surgical presentations. Of these, an inguinal hernia is the most common abnormality. Herniae can become incarcerated or obstructed, therefore patients presenting with a short history of a tender groin lump should be referred for surgical assessment urgently. In the event of a diagnosis of an incarcerated or obstructed hernia, prompt operative exploration and repair is mandated.

We present a case of an emergency presentation of a lump in the groin, with the history and examination consistent with an incarcerated inguinal hernia. However, intra-operative findings and subsequent pathological analysis revealed that the lump was in fact a dermoid cyst of the inguinal canal. The location of this pathological diagnosis, in combination with the acute presentation, render this case almost unique, as dermoid cysts are typically slow growing benign lesions which do not present acutely.

A 19 year old male presented to the Acute Surgical Unit to the care of General Surgery with history of a new left groin lump causing tenderness. The patient reported that the lump had appeared over the course of the last week, with no precipitant. He denied other symptoms, including nausea, vomiting, abdominal pain or absolute constipation. He was otherwise fit and well, with no significant past medical history, and no history of trauma to the groin.

On examination, the patient appeared well with normal observations. Abdominal examination revealed no scars or distension, and palpation demonstrated a soft and non-tender abdomen with no peritonism. At the left inguinal region, a golf ball sized lump was visible superior and medial to the pubic tubercle, in keeping with a diagnosis of an inguinal hernia. On palpation,

the lump was firm, irreducible, and exquisitely tender. The contralateral groin was normal. Within the scrotum, two normal testicles were palpated and external genitalia were normal. Blood parameters were normal, and an abdominal radiograph showed no evidence of obstruction.

A clinical diagnosis of an incarcerated inguinal hernia was made and the patient was consented for an emergency open inguinal hernia repair.

During the operation, and upon opening the external oblique, a 6 x 3.5 x 2.5 centimeter (cm) lesion was encountered emerging through the superficial ring. The lesion had a smooth capsule, was cystic in nature and was fixed to the posterior wall of the inguinal canal. There was no evidence of direct or indirect hernia or lymphadenopathy. The lesion was enucleated with the capsule left intact, and sent for urgent histology out of concern for a potential diagnosis of a rapidly growing liposarcoma. Post-operatively, the patient made an uneventful recovery and was discharged the next day.

Pathological assessment revealed that the lump was a dermoid cyst. The specimen was thin walled and contained sebaceous material. Microscopically, it was keratin filled and lined by epidermis with some mural adenexal structures suggesting that it was a dermoid rather than epidermoid cyst (Figure 1a and b). The surrounding fibrous tissues contained no atypical features.

This case demonstrated a rare cause of an inguinal lump, combined with an even rarer presentation, specifically a one week history of a dermoid cyst with acute tenderness. Dermoid cysts are benign mature cystic teratoma, namely congenital abnormalities which contain mature tissue or organ components of more than one germ cell layer, but at an abnormal location. Their contents may include sebum, hair, teeth and thyroid tissues. Most commonly occurring in the skin, dermoid cysts can ultimately occur in any anatomical location. Typically slow growing, the cysts are only discovered when in non-visible

anatomical locations such as intra-cranial or intra-abdominal spaces, when mass effect causes complications or discomfort. Unlike true malignant lesions with exponential growth rate, dermoid cysts exhibit a linear growth rate over months to years.

Accordingly, it is extremely rare for a dermoid cyst to present with a size of 6 x 3.5 x 2.5 cm in the relatively superficial inguinal canal without any preceding symptoms. We reviewed the specimen to look for any histological markers suggestive of rapid growth such as high mitotic rate, apoptosis or necrosis, but all these features were absent. We then postulated that the cyst had been present but asymptomatic for a longer duration, and the patient presented acutely due to symptoms related to cyst rupture or infection. However, we also failed to find any evidence of an inflammatory response histologically. It is unclear, therefore, what initiated this acute tenderness and sudden presentation in this individual. In the absence of literature to support why this might have been, this case is, to the best of our knowledge, the first to report a rapidly growing dermoid cyst with acute presentation in the inguinal canal.

Although extremely rare, dermoid cysts of the inguinal region have been reported previously. A literature review returned ten cases, with the first reported case in 1971 [1]. Patient age at presentation ranged from two to forty eight years old. There was a high preponderance to male gender with only two cases presenting in the round ligament in females [2,3].

Our patient presented acutely with a short one week history, in contrast to previously reported adult cases which all presented with a longer duration of symptoms (months to years). The only exception to this was a two year old with a two week history of palpable lump. As in our case, the existing literature also describes large dermoid cysts mimicking incarcerated hernias in their initial presentation [2,4].

Ultrasound was the first line investigation in all reported cases with reported 58% sensitivity and 99% specificity in the diagnosis of dermoid cyst [2]. However, false diagnosis such as intramuscular haematoma or an inconclusive study can occur. CT scan and MRI are both

useful in further characterising the content in the lesion and anatomical relations. The presence of fat (93%), Rokitansky protuberance (81%) or calcification (56%) during cross sectional imaging supports a diagnosis of dermoid cyst [5].

Rare complications of dermoid cysts includes torsion, spontaneous rupture, infection or malignant transformation [2]. There has been no description of these complications in cysts occurring specifically in the inguinal region. However, it is reported that pressure exerted by presence of large dermoid cyst in the inguinal region could result in weakening of the inguinal canal's posterior wall, causing a direct inguinal hernia [1]. The recommended treatment of dermoid cysts in the inguinal region is complete surgical resection.

In conclusion, dermoid cysts of the inguinal region are a rare entity. Due to their slow rate of growth, they do not tend to present acutely. Although there have been reported cases of dermoid cysts of the groin mimicking an incarcerated inguinal hernia, our case distinguishes itself due to a short onset of presentation.

This case highlights that although rare, other pathologies of the inguinal region must be considered when assessing a groin lump mimicking a hernia, including in the emergency setting. If there is uncertainty during clinical assessment, sonography or cross sectional imaging such as CT or MRI are useful in aiding diagnosis. Unusual findings intra-operatively should prompt urgent histological assessment.

## Figure Legends

**Figure 1a.** Macroscopic appearance of the excised dermoid cyst showing a thin wall (stained green) and sebum filled cavity with no malignant features.

**Figure 1b.** Microscopic histology showing keratin-filled cyst (A) lined by squamous epithelium (B). Skin adnexal structure such as sebaceous glands (C) are present within the wall, confirming dermoid cyst.

## References

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