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## CASE REPORT

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# Suture Granuloma following Inguinal Herniorrhaphy Mimicking Urachal Tumour

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### ABSTRACT

*A suture or stitch granuloma is a recognised complication of surgical procedures. This entity needs to be considered in a patient with a previous history of surgery presenting with a mass, as it may simulate a soft-tissue tumour. Although inguinal hernias and their repair are common, a suture or stitch granuloma is a rare complication of inguinal herniorrhaphy. This report describes a patient with a suture granuloma mimicking an urachal tumour following inguinal herniorrhaphy.*

*Key Words: Hernia, inguinal; Granuloma; Soft tissue neoplasms; Sutures*

### INTRODUCTION

Surgical complications are negative outcomes of surgical procedures and can occur either early or late in the postoperative period. Surgical complications can be generalised or localised to the operative site. A suture or stitch granuloma is a localised complication following surgery, and is a recognised, although rare, complication of inguinal herniorrhaphy. As suture or stitch granuloma can have a complex appearance and mimic a soft-tissue tumour at imaging, it is important for clinicians to be alert to this condition and to consider a history of previous surgery when evaluating images of a patient presenting with an abdominal or pelvic mass. This report is of a man with an abdominal mass following inguinal herniorrhaphy.

### CASE REPORT

A 63-year-old man presented in 2004 with a left inguinal hernia of 20 years' duration that had been increasing in size and had become irreducible. He also had non-insulin dependent diabetes, hypertension, left ventricular hypertrophy, benign prostatic hypertrophy, and mild renal impairment.

He underwent a conventional left inguinal herniorrhaphy with mesh repair and an omentectomy. Surgery was uneventful and he was discharged after clinic review 3 weeks after surgery.

He presented 5 months later with abdominal pain, distension, and an inability to open his bowels for 2 days. At physical examination, there was a soft mobile mildly tender infraumbilical central abdominal mass. He was afebrile and his biochemical profile was within normal limits. Complete blood count did not show leukocytosis.

A computed tomography (CT) scan of the abdomen revealed a heterogeneously enhancing soft-tissue mass with mixed solid and cystic components, which was intraperitoneal and located just to the left of the midline (Figures 1, 2, and 3). There was streakiness of the surrounding mesentery. The left rectus muscle was thickened and there was compression of the adjacent small bowel loops and the transverse colon. Due to the location and appearance of the mass, the impression was of a soft-tissue tumour such as an urachal tumour, liposarcoma, or desmoid tumour or, less likely, an urachal abscess.

Due to the uncertainty of the nature of this mass, a CT-guided percutaneous biopsy was performed. Histopathological results showed acute and chronic inflammatory exudates with inflammatory cells with no organisms or evidence of malignancy.

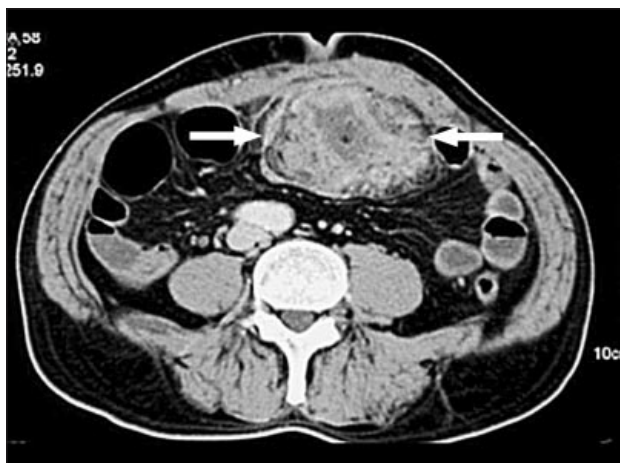
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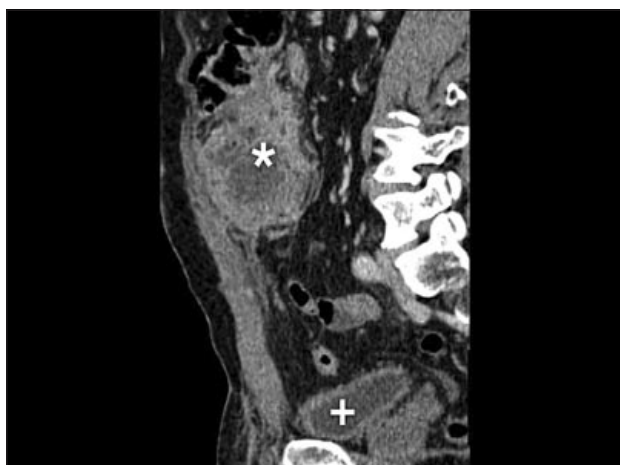
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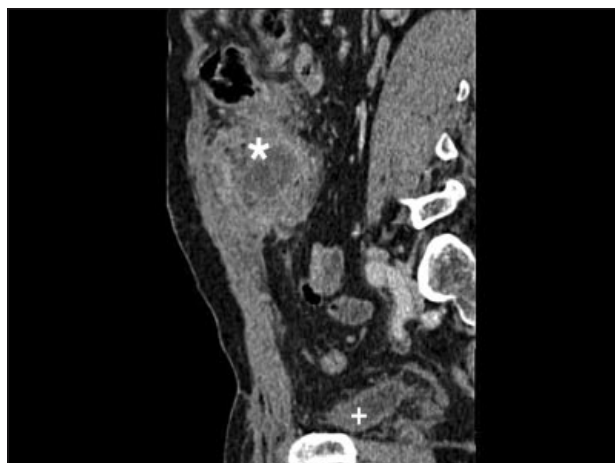
**Figure 1.** Contrasted axial computed tomography scan of the abdomen showing a heterogeneously enhancing soft-tissue mass (white arrows) to the left of the midline.



**Figure 2.** Reformatted sagittal contrasted computed tomography image at the midline showing a heterogeneously enhancing soft-tissue mass (asterisk) in the abdomen superior to the urinary bladder (cross).

The patient underwent laparotomy with excision of the mass and transection of the urachus. As the mass was adherent to the omentum and part of the transverse colon, these were excised as well. The patient recovered uneventfully and was well at clinic review 3 weeks after surgery.

Histopathology of the surgical specimen revealed a lobulated mass with solid yellowish-white tissue, with a cystic space of 8 x 3 x 2 cm within the mass containing pus and myxoid material. Suture material was also noted within the cystic space. Fibrocollagenised tissue, occasionally intersected by adipose tissue exhibiting areas with neutrophils, lymphoplasmacytic infiltrates, and occasional granuloma formation, was noted in the specimen. The cystic area was lined by foamy macrophages with marked chronic inflammatory infiltrates



**Figure 3.** Reformatted sagittal contrasted computed tomography image in the left paramedian region showing a heterogeneously enhancing soft-tissue mass (asterisk) in the abdomen superior to the urinary bladder (cross).

with foreign body-type multinucleated giant cells. Culture was sterile and there was no evidence of tuberculosis. The urachus was unremarkable and there was no evidence of malignancy in any part of the excised specimen. The final interpretation of the excised specimen was an abscess with foreign body granuloma.

## DISCUSSION

A literature search shows that suture granulomas complicate many types of surgical procedures such as herniorrhaphy/herniotomy, suprapubic prostatectomy, thyroidectomy, circumcision, and renal surgery. However, suture granuloma is a rare complication of inguinal herniorrhaphy.

A suture granuloma has a variable time of onset, occurring from several months to 11 years post-surgery.<sup>1</sup> The risk of occurrence is associated with the type of suture used, the duration that the suture is left in the tissue, suture size, anatomical site, sex, advancing age, and surgeon's experience. Braided suture material and silk sutures are associated with a higher risk of occurrence.

In a 10-year review of stitch granulomas following 2447 inguinal herniotomies by Nagar, the incidence was found to be low at 0.3% of the procedures.<sup>2</sup> This researcher found that it was associated with male sex, emergency herniotomy, surgery during the neonatal period, and younger age at the time of surgery. Suture granulomas in this series were reported to occur in the right lower quadrant with pain and a palpable mass mimicking periappendicular abscess, and locally at the site of surgery. One patient had a sinus tract from the

umbilicus to the inguinal region containing a stitch granuloma.

The presentation of a suture granuloma post-herniorrhaphy can include urinary symptoms (especially if it has a paravesical location) or a suprapubic mass.<sup>3</sup> Suture granuloma can also present as a paravesical abscess with swelling and tenderness at the groin area. In this location, urinalysis can be positive for microscopic haematuria and leucocyturia.<sup>4</sup> Paravesical granulomas can also present with lower urinary tract symptoms. Fever and leukocytosis are not features of suture granuloma, as it is usually a slowly developing chronic abscess.<sup>5</sup> In the patient described here, it is likely that after the hernial sac was tied off and pushed into the internal ring, suture material migrated to the superior aspect of the urinary bladder.

The appearance of suture granuloma at imaging is variable and it can appear as a heterogeneous mass with cystic and solid areas or as an area of bladder wall thickening.<sup>3</sup> Suture granuloma may or may not be associated with lymphadenopathy. CT scan in this patient revealed a suture granuloma appearing as a heterogeneously enhancing mass with mixed solid and cystic components. Ultrasound also has a role to play in the diagnosis of suture granulomas post-herniotomy in children. Ultrasound has been found to be an accurate, cost effective, and non-invasive procedure, and demonstrates the granuloma as a complex fluid collection with septa and debris.<sup>6</sup> In approximately 70% of patients, suture material was identified within the mass.

In this patient, a diagnosis of urachal carcinoma or abscess was considered because of the appearance and location of the mass. The urachus is the remnant of the allantois that connects the urinary bladder to the umbilicus. In a series of 25 patients with surgically proven urachal carcinomas, it was found that most tumours were complex mixed solid and cystic masses; located in the midline.<sup>7</sup> A minority of the tumours were purely solid. Due to the mucinous content of an urachal tumour, it has a propensity for psammomatous calcification, usually in the periphery of the tumour. Bladder wall invasion is common, although it may not be readily apparent on CT scan. It was thus suggested that

thinner section imaging with multidetector scanners and multiplanar reformatting could improve evaluation.<sup>7</sup> The mass in this patient showed no evidence of calcification. However, the mass had all the other features of urachal carcinoma.

A desmoid tumour could also have a similar appearance, although it tends to be more solid, with a higher attenuation than muscle, with peritumoural fibrotic or desmoplastic reaction and retraction of surrounding structures.<sup>8</sup> Another differential diagnosis is liposarcoma, which can have a non-specific appearance, enhances with contrast but usually contains some fat.<sup>8</sup>

This case report is intended to highlight the need to consider a suture granuloma in the differential diagnosis for any patient who presents with urinary symptoms or a mass and who has a history of inguinal herniorrhaphy or other abdominal or pelvic surgery. As the time of presentation is variable and may be many years after surgery, it is important to elicit a history of any previous surgery. Percutaneous biopsy or excisional biopsy is important, not only to prevent unnecessary radical surgery or inappropriate therapy should an erroneous diagnosis of a tumour be made, but also to avoid unnecessary anxiety to the patient.

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