CASE REPORT

Fibrolipomas masquerading as abdominal hernias

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SUMMARY

A 15-year-old Caucasian girl presented to her general practitioner with a tender, irreducible mass in the paraumbilical region. On examination, two small masses could be felt. She was referred to general surgery. Ultrasound imaging and MRI were unremarkable. However, clinical suspicion suggested multiple areas of abdominal wall herniation. The patient was admitted for elective surgery to exclude herniation. At operation, three subcutaneous masses were found but with no evidence of abdominal wall herniation. Histopathology results from the specimens showed mature adipose tissue mixed with fibrous deposits. There was no evidence of malignancy. A diagnosis of fibrolipoma was given.

BACKGROUND

Lipomas are benign tumours of mature adipose tissue, and when interspersed with collagenous tissue they are named fibrolipomas. They may occur anywhere within the body's subcutaneous tissues. Typically, patients present with a slow-growing, painless mass that is mobile on examination; they can be solitary or multiple. Painful lipomas are the result of nerve compression. This case illustrates the diagnostic challenges of abdominal masses in otherwise fit and healthy adolescents. It shows that clinical examination does not always correlate with imaging results and that histopathology examination may be the only true diagnostic modality in this situation. Fibrolipomas should be considered more readily in the differential list of abdominal masses in healthy adolescents.

CASE PRESENTATION

A 15-year-old competitive gymnast presented to her general practitioner (GP) with a 1-week history of paraumbilical pain that was worse on exertion. There were no other relevant presenting symptoms and a full systemic enquiry was unremarkable. No direct trauma history was provided. Medical history consists of asthma and eczema. Of note, the patient has no surgical history and has never injected insulin, lower molecular weight heparin or hormonal treatments into her abdomen. The patient takes no regular medications and has no drug allergies. On general examination, the patient's observations were within normal limits and there was no lymphadenopathy or signs of oral manifestations of disease. She had normal heart sounds, and her chest was clear to auscultation. On examination, there were two palpable 1 cm firm, irreducible circular masses in the paraumbilical region which were fluctuant and tender to touch. The masses were mobile in relation to each other. On further examination, they had a smooth surface and

normal overlying skin with no obvious erythema or bruising to the area. There was no heat radiation from the masses. There was no obvious pulsation or thrill and they did not trans-illuminate. It was difficult to know whether there were audible bowel sounds specifically from that area on auscultation. The GP referred the patient for outpatient imaging. Abdominal ultrasound imaging suggested possible lymph gland involvement. As this did not correlate well with the clinical picture, the patient was referred for a general surgical opinion. The patient was seen in the outpatient department. On examination, two paraumbilical masses could be felt in proximity; there was clinical suspicion of herniation due to the location of the masses and the pain felt on exertion in this patient. As multiple hernias were suspected and the patient was in pain, MRI was carried out. MRI showed an intact abdominal wall with no reported evidence of herniation. The clinical examination at this time did not match the radiological findings. Given this, plus ongoing pain and aesthetic concerns, the patient was admitted for elective day case exploratory surgery. At operation, three subcutaneous masses were found but with no evidence of abdominal wall herniation. The three small masses were removed and sent for histopathology. At this stage, herniation was ruled out and a provisional diagnosis of fat necrosis was given.

INVESTIGATIONS

The patient underwent both ultrasound scanning and MRI. The ultrasound (figure 1) was carried out first and suggested possible lymph gland involvement. After referral to general surgery, there was enough diagnostic uncertainty to merit MRI (figures 2 and 3). MRI of the pelvis and abdomen confirmed an intact abdominal wall with no

Figure 1 Abdominal ultrasound imaging demonstrating no evidence of abdominal wall herniation.

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Figure 2 MRI of the abdomen and pelvis in the sagittal plane demonstrating no evidence of abdominal wall herniation.

reported evidence of herniation. At operation, three subcutaneous nodules were removed. These were sent for histopathology. Macroscopically the specimens measured 18×4×9, 19×14×7 and 14×9×5 mm. Microscopically, the specimens comprised adipose tissue mixed with fibrous tissue (figure 4A,B). Capsules were noted. There was no evidence of malignancy in any of the specimens.

DIFFERENTIAL DIAGNOSIS

Abdominal wall masses in younger adults can be divided into five general causative categories: neoplastic, inflammatory/infective, traumatic, iatrogenic and congenital. In this case, one should consider haematomas, abscesses, injection granulomas, metastatic disease, lymphoma, sarcoma, mesenchymal tumours (including lipomas) and desmoid tumours.¹ An important additional differential diagnosis in reproductive age women is endometriosis, which would typically present with cyclical pain, not present for this individual. Herniation should also be considered due to the location of the lumps and presence of pain.

Figure 3 MRI of the abdomen and pelvis in the transverse plane demonstrating no evidence of abdominal wall herniation.

Metastatic disease, although a differential, would be unlikely, given the patient's age and absence of a primary tumour.

TREATMENT

After imaging reports did not correlate well with the clinical picture, the patient was consented for a day case exploratory operation. At operation, a 1.5 cm vertical incision was made superior to the umbilicus over the linea alba. No hernial defect was identified in the fascia at this stage. Sharp dissection was used to remove three lesions: two from the epigastric region and one from superior to the umbilicus. Haemostasis was ensured and local anaesthetic was administered. There were no immediate postoperative complications. The patient was discharged the next day.

OUTCOME AND FOLLOW-UP

The patient was followed up in the outpatient department 8 weeks postsurgery. Fortunately, she was asymptomatic with no residual pain and was able to carry out gymnastics as before.

DISCUSSION

Lipomas are composed of mature adipocytes and are defined as 'benign soft tissue tumours'² or mesenchymal neoplasms.³ When interspersed with collagenous tissue they are named fibrolipomas. Lipomas may be solitary or multiple. They are largely asymptomatic non-tender lesions. Associated pain is mainly due to compression of surrounding neural structures. Most lipomas are well circumscribed with smooth borders, allowing for simple surgical excision. They mostly appear on the upper and lower extremities.²⁻⁴ However, lipomas may occur anywhere in the subcutaneous layer of the body. There is minimal literary evidence of abdominal wall lipoma formation. Lipomas are commonly round in nature but may also show a fusiform pattern.⁴

There has been a little description of fibrolipomas occurring in athletic, young individuals, such as the female patient described in this case. The usual demographics for idiopathic lipomas are female,²⁻³ middle-aged² and obese patients. Many reports document a female preponderance but some case series do differ.⁴ Hormonal differences within adipose tissue have been suggested as a contributing factor to the mostly documented female preponderance.⁴

Despite their commonality, lipomas have an undefined aetiology and pathogenesis. Several mechanisms have been postulated but are as yet unsubstantiated by definitive evidence. To our knowledge, there has been no specific research into the development of abdominal wall fibrolipomas. Similarly, little evidence exists on the mechanisms of fibrolipoma appearance in the adolescent population.

The first hypothesis suggests that some lipomas may be post-traumatic injuries rather than idiopathic events. Following blunt soft tissue trauma, it is possible that there is movement of adipose tissue to form the lipoma. If Scarpa's fascia is breached in the relevant areas of the body, then it is possible for the underlying adipose tissue to herniate or prolapse through. This type of lipoma has been renamed as a 'pseudolipoma' as there is no new growth of adipose tissue and no surrounding capsule.⁵⁻⁶ The second hypothesis proposes that after tissue trauma, a haematoma develops that leads to inflammation. With the inflammatory response, the release of cytokines may stimulate preadipocytes to differentiate into mature adipocytes, therefore leading to lipoma formation.⁵⁻⁶ Regardless of the mechanism, these lipomas are termed 'post-traumatic pseudolipomas'. Importantly, for traumatic lipomas, the demographics shift to a much greater predominance in females than in males.³⁻⁵ There has also been suggestion that

Figure 4 (A) Histopathology slides of one of the resected specimens showing fibrous bands intersecting mature adipose tissue. H&E stain used at $\times 100$ magnification. (B) Histopathology slides of one of the resected specimens showing fibrous bands intersecting mature adipose tissue with the edge of the fibrous capsule also visible. H&E stain used at $\times 40$ magnification.

only injuries predisposing to fat necrosis can lead to the end point of a lipoma, meaning that injuries have to be of a certain magnitude to have the capability of lipoma induction.⁴ There have been reports of acute, chronic and occupational trauma, leading to the formation of post-traumatic pseudolipomas. It appears that the thighs and buttocks are the most susceptible areas for the development of lipomas following trauma. It is possible that our described patient had traumatic injuries to the abdomen related to general gymnastic activities, rather than from a specific event.

Some studies have suggested that clinical diagnosis is usually highly suggestive of a lipoma and imaging is often not necessary.^{2,7} Our case demonstrates that there can be clinical discrepancy despite multiple physical examinations by different clinicians and other reports are in agreement.⁸ The majority of studies have looked at a middle-aged patient cohort, so perhaps adolescent presentations can dilute the certainty of diagnosis. In some reports, the majority of patients did not undergo imaging prior to surgical excision or liposuction, as the diagnosis was felt to be clear-cut. These same reports suggest ultrasound to be the most appropriate method of imaging with MRI being used mostly to distinguish lipoma from liposarcoma.² There is little mention in the literature on the next stage of imaging post-MRI if surgery is to be avoided. CT scanning has been indicated in some patients but may not be appropriate in many patients, including the patient presented, due to the burden of radiation. Importantly, there have been studies to show that ultrasound has a low accuracy for diagnosing lipomas and differentiating them from other soft tissue masses.⁹ Our case very much supports this concept in that ultrasound imaging was largely unhelpful in making the final diagnosis.

Malignancy in relation to lipomas is very rare, with the most likely being a liposarcoma. The presentation is fairly similar to that of a lipoma, therefore clinical suspicion must be acted on. The concerning features on MRI include non-homogenous density or connections to the underlying fascia.¹⁰ Fortunately, these features were not present in this patient.

Benign lipomatous growths expand without infiltrating neighbouring tissues and are often encapsulated. For this reason they are largely simple to surgically excise or remove with liposuction. If liposuction is performed, then an incision biopsy should be undertaken first to rule out liposarcoma. Liposuction has the benefit of reduced scarring postoperatively. However, liposuction is not ideal when there is a connective fibrous network through the lesion.⁸ Low recurrence rates postsurgery are the normal outcome for the majority of patients.⁸ Non-excisional techniques have also been developed which include using

steroid injections directly into the lipoma. Varying steroid volumes at multiple time points are needed to induce fat atrophy within the lipoma itself. However, it is important to note that not all lipomas require excision. By nature they are benign lesions and need not be removed for aesthetic reasons alone. Surgical excision includes risks, such as infection, nerve damage, vessel damage and scarring⁷; all of which may be a greater burden than the primary concern of fibrolipoma.

CONCLUSION

During the process of clinical investigation, this patient was given multiple diagnoses ranging from lymph gland pathology to abdominal wall herniation to fat necrosis. Only histopathological investigation was able to confirm a diagnosis of fibrolipoma. This young patient underwent multiple investigations that helped to rule out certain causes, but failed to lead to a definitive diagnosis. From this patient's history, fibrolipomas should be more readily considered in the differential diagnosis of subcutaneous abdominal masses, even in young athletic individuals. Imaging was of little use in this case as surgery was still merited. Therefore, establishing a more effective diagnostic strategy will save unnecessary surgery being carried out on young healthy individuals, and surgery will allow for completeness of excision.

Learning points

- ▶ Fibrolipomas need to be considered as a diagnosis in adolescents.
- ▶ Abdominal fibrolipomas can be clinically mistaken for abdominal wall hernias.
- ▶ Imaging may leave diagnostic uncertainty.
- ▶ Histopathological investigation was the only modality able to diagnose fibrolipoma, in this situation.
- ▶ Surgical excision led to a successful outcome for this patient.

Competing interests None.

Patient consent Obtained.

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