CASE REPORT

Cyclist's nodule: no smooth ride

Adam Stoneham,¹ Khin Thway,² Christina Messiou,³ Myles Smith⁴¹Department of Plastic Surgery, Queen Alexandra Hospital, Portsmouth, UK²Department of Histopathology, Royal Marsden Hospital, London, UK³Department of Radiology, Royal Marsden Hospital, London, UK⁴Department of Sarcoma Surgery, Royal Marsden Hospital, London, UK**Correspondence to**Adam Stoneham,
acsstoneham@hotmail.com

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SUMMARY

A fit and active amateur cyclist was referred by his general practitioner to a surgical oncology outpatient clinic with a slowly-growing perineal mass. Following clinical examination, the patient underwent imaging and biopsy at a tertiary soft tissue tumour centre, which diagnosed perineal nodular induration: a rare, benign tumour caused by repetitive trauma associated with 'saddle sports' such as cycling or horse riding. It is important to consider soft tissue tumours in patients who present with 'lumps and bumps'; they can occur anywhere in the body including the groin or perineum, where it is sometimes referred to as a 'third' or 'accessory' testicle in men. Although unusual, the case emphasises the importance of rapid specialist referral from primary care, and consideration of a patient's occupation and hobbies when formulating diagnoses.

BACKGROUND

Neoplasms must always be considered in patients who present with unusual lumps and bumps.

Perineal nodular induration, or 'Cyclist's Nodule', is a rare but striking example of a benign neoplasm. It is probably underdiagnosed, especially given the rising popularity of sports such as cycling.

The case emphasises the importance of rapid specialist referral from primary care, and is a reminder of the importance of a patient's occupation and hobbies when formulating diagnoses.

CASE PRESENTATION

A 63-year-old Caucasian van driver, presented via his general practitioner to the surgical oncology outpatient department of a specialist soft tissue tertiary centre, having noticed a lump adjacent to his left testicle. He had no constitutional symptoms, and neither gastrointestinal nor genitourinary disturbance. He was fit and healthy with no contributory medical history, and reported to be a keen amateur cyclist.

On examination, the patient was found to have a smooth, round, indurated mass in the skin crease between the left thigh and buttock. It was superficial and immobile with no overlying skin changes. There was no associated lymphadenopathy.

INVESTIGATIONS

The National Institute of Health and Care Excellence (NICE) recommends 'urgent direct access ultrasound' as a first-line investigation to assess for soft tissue tumours in adults with an unexplained lump that is increasing in size.¹ Box 1 lists some of the other features of a lump that should raise suspicion of malignancy. Uncertain

Box 1 Features suggestive of malignancy in a lump (adapted from National Collaborating Centre for Cancer²)

- ▶ Lump >5 cm
- ▶ Lump increasing in size
- ▶ Lump deep to fascia
- ▶ Pain

ultrasound findings or those in keeping with sarcoma warrant a 2-week referral pathway to a specialist centre, for further investigations and/or treatment.

MRI has the advantage of greater tissue characterisation and is therefore frequently used as the next diagnostic step (figures 1 and 2). Contrast-enhanced CT of the thorax, abdomen and pelvis is advocated for staging if a malignancy is diagnosed.

At specialist sarcoma centres, biopsies can be taken 'free-hand' or under image guidance (ultrasound or CT) for more technically difficult procedures. Histological examination and subtype determination via H&E light microscopy and immunohistochemistry are the mainstays of diagnosis (figures 3–5).

Histologically, the patient's lesion comprised sparsely cellular collagenous fibrous tissue containing prominent fragmented, damaged elastic fibres. Interspersed within the fibrous tissue were patternless distributions of small spindle cells with elongated or ovoid hyperchromatic nuclei and scanty fibrillary cytoplasm. Atypical features such as pleomorphism, cytological atypia, necrosis or mitotic figures were absent. Assessment by a specialist soft tissue pathologist is crucial because of the rarity of the lesion and the associated lack of diagnostic recognition by many non-soft tissue pathologists. It is particularly important to ensure that this is not misdiagnosed as a locally aggressive neoplasm such as fibromatosis, or of a malignant neoplasm such as

Figure 1 Axial T2-weighted MRI showing a lesion (arrow) to the left of the perineum.

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Figure 2 Coronal T2-weighted MRI of the pelvis demonstrating an irregular plaque of subcutaneous low signal tissue in the left side of the perineum (arrow). The morphology and low signal indicate a predominantly fibrinous content. The mass is situated immediately below the ischial tuberosity (dashed arrow), which acts as a pressure/friction point while cyclists are in the saddle.

low-grade fibromyxoid sarcoma, with the likelihood of clinical overtreatment.

DIFFERENTIAL DIAGNOSIS

Lumps and bumps around the groin or perineum are common, and clinical differential diagnoses (depending on the patient's age and sex) include: lymph nodes, herniae, hydrocoeles, varicoceles, aneurysms and—importantly—various neoplasms.

The site of the mass, natural history and associated symptoms are all useful diagnostic pointers. Specific inquiries relating to bowel, bladder and sexual function indicate which systems may be involved. If one suspects malignancy, it is important to consider symptoms suggestive of metastasis. A family history can identify patients at high risk of inherited disease. A good social history—including smoking status, occupation, and hobbies—is indispensable.

The lesion should be examined carefully. Some conditions have distinctive clinical signs, including: cough impulse

Figure 3 The lesion shows sparsely cellular collagenous tissue containing prominent fragmented, damaged elastic fibres. Interspersed within the collagenous tissue are patternless distributions of small spindle cells with elongated or ovoid hyperchromatic nuclei and scanty fibrillary cytoplasm. No atypical features, such as pleomorphism, cytological atypia, necrosis or mitotic figures, are present (H&E).

Figure 4 Immunohistochemically, the lesion shows focal expression of CD34, and this can be seen accentuating the cell processes on the left. The lesion is also seen to entrap mature adipose tissue (right of field).

(herniae), pulsatility (aneurysms), or a punctum (sebaceous cysts). The presence of local and regional lymph nodes should be documented, although some tumours, such as sarcomas, practically never metastasise via the lymphatic system.

TREATMENT

There are over 50 recognised soft tissue tumour subtypes, so accurate diagnosis and correct management invariably benefit from the expertise of a specialist multidisciplinary team (MDT) consisting of surgeons, oncologists, radiologists, and pathologists. As a general rule, if the tumour shows malignant features, it is excised with the widest possible anatomical margin plus or minus adjuvant or neoadjuvant radiotherapy or chemotherapy. If it is benign (and not causing significant symptoms), a period of clinical and/or radiological observation can be adopted to confirm an indolent nature.

This patient's findings were presented at the 'Soft Tissue Sarcoma' MDT meeting. Rather than undergoing surgery, he elected to make some practical lifestyle changes including a reduction in his cycling activity and a change of saddle, and serial imaging to assess growth.

OUTCOME AND FOLLOW-UP

At the last follow-up appointment, we examined the patient and correlated our clinical findings with repeat MRI scans. The

Figure 5 The fragmented elastic fibres show prominent staining (black) with the elastic Van Gieson (EVG) special stain.

Figure 6 Axial T2-weighted MRI 5 months later shows reassuringly stable appearances.

Patient's perspective

[Written by the patient; transcribed by AS]

- ▶ I first noticed the lump one morning in bed early in 2014. My GP referred me to Colchester General for [an] ultrasound scan. As this was inconclusive I then had an MRI scan. I had tried to be positive but there [are] always doubts and worries that this could be very serious. Being referred to Royal Marsden came as a shock really and increased the concern that this could be more serious than I had thought. The worst part is not knowing what is wrong. So many thoughts going through your mind. What will they do? What will they say? What if it is bad news? How will I cope? How do I deal with my deepest darkest fears? What does the future hold? Do I have a future? When you know there is a lump you are aware of it all the time.
- ▶ Needless to say I felt very nervous on my first visit to the Royal Marsden. Like so many others I was dependent on the skill and knowledge of strangers. Mr Smith, however, was very reassuring and confident that he could diagnose and treat whatever the lump was. The biopsy was painless but the lump was harder than I thought and broke the needle. Like many medical procedures [it] is not the most pleasant thing but you have to put up with it. After the biopsy, a sister, who I think was called Sam, came and had a chat with us. She was wonderful, very reassuring and at the end of the telephone if we wanted to talk to her after we had left the hospital.
- ▶ Being told at my second visit that it was benign was a great feeling. All the worry disappears as the cause of the problem is cycling I would expect it to be quite common. But the opposite seems to be the case.
- ▶ On the third visit [for] the MRI scan, the staff were very professional and supportive. As I had an MRI before, I knew what to expect.
- ▶ Finally, at the last visit, the news was that the lump had not grown since the first MRI at Colchester.
- ▶ Looking back: The atmosphere at the Royal Marsden was positive, whatever the diagnosis was to be, you knew that you would get the best treatment. In particular, having a nurse you could contact to share your worries with. You don't always think of the questions you need to ask the doctor and, if you are seriously ill, may not even hear or remember what he says. I am sure that if you need long-term treatment, then his support is priceless. It is a very daunting experience to be referred to an institution like the Royal Marsden. Most of the staff from the moment you arrive are aware that patients need a bit of TLC.

Learning points

- ▶ Lumps and bumps are a common presentation to primary care, and malignant causes should always be considered (see [box 1](#)).
- ▶ General practitioners should organise urgent ultrasound studies for all adults with an unexplained lump that is increasing in size and seek specialist referral under the 2-week pathway for those with uncertain findings or findings suggestive of a soft tissue sarcoma.
- ▶ A patient's occupation and hobbies define who they are and sometimes prove a goldmine of diagnostic and prognostic information.

nodule appeared reassuringly stable in size and signal characteristics ([figure 6](#)).

DISCUSSION

Perineal abnormalities are common in those who engage in 'saddle sports' such as cycling or equestrianism; some suggest as many as 95% of male cyclists and over 75% of equestrians have scrotal abnormalities on ultrasound.^{3 4}

Common pathologies include varicoceles, hydroceles, spermatoceles, scrotoliths, and abnormal calcification. Although these can be asymptomatic, the patient who presents with a palpable perineal mass warrants urgent investigation.

Perineal nodular induration is a very rare—although possibly underdiagnosed⁵—condition. It is thought to be caused by repetitive microtrauma from contact between the perineum and saddle. It presents as one or more lumps, with or without pain, on either side of the raphe, and sometimes assumes the appearance of a 'third' or 'accessory' testicle in men.

Histopathologically, the lesion can mimic a variety of benign and malignant tumours, including nerve sheath tumours, fibromatosis, aggressive angiomatoma, and low-grade fibromyxoid sarcoma, which highlights the importance of assessment of biopsy or excision material by a specialist soft tissue pathologist.

Other case studies exist in the literature^{6 7} but, to the authors' knowledge, there is no systematic review, neither is there consensus as to the management; lifestyle interventions such as reducing the culprit activity, or changing equipment and riding style seem prudent, and have shown to be successful anecdotally, although more radical approaches such as use of steroids or surgical resection have been posited.

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Contributors AS initiated the project, researched the topic, sought consent from the patient, wrote the majority of the text, liaised with the other authors, and submitted the manuscript. KT wrote sections of the manuscript pertaining to histopathology as well as providing suggested modifications elsewhere, and also produced the histological images and figure legends. CM wrote sections of the manuscript pertaining to radiology as well as providing suggested modifications elsewhere, and also produced the radiological images and figure legends. MS supervised and mentored the project, communicated between the different authors, oversaw the writing of the manuscript, and reviewed each successive draft, with comments and suggestions.

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