Desmoid fibromatosis associated with Endobutton use for anterior cruciate ligament reconstruction

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DESCRIPTION
A man in his 30s presented with a posterolateral left knee lump and paraesthesia involving the left lower leg. He had undergone arthroscopic anterior cruciate ligament reconstruction 18 months previously, (figure 1) following a sporting injury, using a hamstring graft secured with Endobutton CL Ultra (Smith & Nephew, MA, USA) onto the femur. A mass was discovered, with its epicentre located at the posterolateral distal femur Endobutton site (figure 2). This was biopsied under ultrasound guidance and immunohistochemical staining confirmed desmoid fibromatosis (figure 3). He had no other medical history. There was no personal or family history of polyposis.

Anterior cruciate ligament reconstruction (ACLR) is a common operation with increasing incidence, and the Endobutton is a frequently used graft femoral fixation device.1 2 Complications associated with Endobutton use are rare, but may include incomplete Endobutton passage and soft tissue interposition (both of which result in loss of graft tension following surgery), and more rarely the intra-articular displacement of the Endobutton itself.3 4

Desmoid fibromatosis (DF) is a rare, aggressively-growing benign connective tissue tumour which accounts for 0.3% of all neoplasms.5 Its aetiology is unknown but most cases occur sporadically, usually due to beta-catenin pathway mutations.6 DF is associated with genetic factors, hormonal influences and trauma.7 DF is also associated with familial adenomatous polyposis (FAP), particularly after surgical trauma.8 9 It may occur anywhere in the body and is characteristically locally invasive, with high recurrence rates.5 9 10 DF has been found postsurgical treatment, particularly with breast implant usage.11 Proposed inciting factors include foreign body reactions and surgical trauma, and it has been suggested that DF may arise from the fibrous capsule which forms around breast implants.8 11 12 Polyethylene terephthalate (PTE), or Dacron, is a synthetic polymer used medically in vascular grafts, meshes, ligament and tendon repairs.13 Reported complications with PTE use include foreign body reactions, inflammatory responses and synovitis.13 DF has previously been associated with silicone-type breast implants, and iterations of this implant have contained PTE on the external surface.11 14 15 We do not believe this association has been extrapolated to orthopaedics, where PTE is commonly used in Endobutton ACLR, ligament advanced reinforcement systems, tape locking screws and Ticron sutures.16–19

Although surgical trauma is another risk factor for the development of DF, it may be less important than other factors such as breast implant usage.12

Figure 1 Preoperative MRI sequences of patient’s left knee indicating anterior collateral ligament rupture.

Figure 2 Selected coronal and axial MRI sequences of patient’s left knee. The heterogeneous soft tissue tumour is highlighted adjacent to the patient’s lateral femoral condyle (red arrow).

Figure 3 Histological images showing biopsy taken from knee. The images highlight several histological characteristics of desmoid fibromatosis. These include (from left to right): delicate spindle cells with non-atypical wavy nuclei and a single nucleolus close to the nuclear membrane, a parallel fascicle arrangement and immunoperoxidase staining for beta catenin showing both nuclear and cytoplasmic staining.
Desmoid fibromatosis (DF) is an extremely rare but aggressive, benign tumour.

DF may be associated with polyethylene terephthalate (PETe)-containing medical equipment, such as various orthopaedic implants and breast implants.

Clinicians should consider DF when patients with PETe-containing implants present with pain, swelling and/or masses around the implant site.

**Learning points**

- Desmoid fibromatosis (DF) is an extremely rare but aggressive, benign tumour.
- DF may be associated with polyethylene terephthalate (PETe)-containing medical equipment, such as various orthopaedic implants and breast implants.
- Clinicians should consider DF when patients with PETe-containing implants present with pain, swelling and/or masses around the implant site.

**Contributors** OOO, RA, NE and RUA drafted and approved the final version of this manuscript.

**Funding** The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

**Competing interests** None declared.

**Patient consent for publication** Consent waived.

**Provenance and peer review** Not commissioned; externally peer reviewed.

Case reports provide a valuable learning resource for the scientific community and can indicate areas of interest for future research. They should not be used in isolation to guide treatment choices or public health policy.

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**REFERENCES**