CASE NOTE

Myositis ossificans traumatica of the abdominal wall

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Myositis ossificans traumatica, a heterotopic bone formation arising after trauma or surgery, is exceedingly rare, although it has been recognized for a long time. Its cause remains obscure, but it may be due to osteoblastic metaplasia of multipotential mesenchymal cells after trauma or due to implantation of bone or periosteum into the soft tissues during surgery. This report refers to an interesting case of this peculiar condition.

Case report

A 47-year-old African-American man was seen at our institution for repair of a large incisional ventral hernia. One year earlier he had undergone laparotomy at another institution secondary to a stab wound to his abdomen. At that time, the abdominal wall remained open for 3 months. Afterwards he had a split-thickness skin graft with no fascial closure.

During the surgical procedure, the surgeon released dense adhesions between the split-thickness skin graft and the underlying bowel. A V-shaped fragment of bone was removed from the abdominal wall (Fig. 1) and sent for pathological examination. Microscopically, it consisted of mature bone with bone marrow elements (Fig. 2). Postoperatively, the patient reported shoulder stiffness, which he had experienced since his initial laparotomy. Imaging studies showed diffuse exostosis and heterotopic ossification at the bilateral shoulder girdles.

The patient did well postoperatively and is being followed up for his shoulder exostosis, which may require surgical treatment.

Discussion

Heterotopic ossification occurs when bone forms in tissues that normally do not ossify. When present in midline abdominal surgical incisions it has been considered as a subset of myositis ossificans traumatica in which osseous, cartilaginous and sometimes bone marrow elements develop.[1] Although recognized for a long time, this condition is rare, given the large volume of abdominal surgery routinely performed.[2]

Myositis ossificans traumatica occurs in vertical incisions and has not been reported in transverse incisions.[1] In addition, this process is about 10 times more common in men than in women.[3] The presence of cartilaginous, bony and occasionally bone-marrow elements distinguishes this entity from dystrophic calcification in which calcium salts deposit in devitalized bone.[1,2]

The cause of myositis ossificans traumatica remains obscure; however, it has been associated with a wide range of etiologies, including trauma, prolonged immobilization, previous surgery and burns. There are 2 main theories for the occurrence of this condition.

The first theory states that small particles from the periosteum or perichondrium of the xyphoid process or symphysis pubis are inoculated

Fig. 1. V-shaped fragment of bone removed from the area of the previous surgery in the mid-abdominal wall.

intraoperatively into the surgical wound, leading to bone formation. This theory is supported by the fact that most reported cases have arisen in midline vertical surgeries where the incision most probably reaches the xyphoid process superiorly or the symphysis pubis inferiorly.[2]

The second theory suggests that bone formation is secondary to immature pluripotential mesenchymal cells that differentiate into osteoblasts or chondroblasts as a result of trauma.

Neither of these theories is sufficient to explain all the cases of heterotopic bone formation. The first theory is inconsistent with the fact that this phenomenon is extremely rare after surgery involving large bones where more contamination with bone particles would occur. The second theory fails to explain the occurrence of this phenomenon in vertical incisions only.[2,4] In our patient's case, the presence of heterotopic bone formation in the shoulders, not previously operated on and after the patient had been immobilized for 3 months, suggests that the occurrence of trauma of any kind could be behind this event and that a combination of factors is more likely to be involved, including individual predisposition.

The treatment is complete excision with primary closure in symptomatic patients. Recurrence has been reported occasionally.[2] In our patient's case, there were no signs of recurrence at follow-up 4 months postoperatively.

Competing interests: None declared.

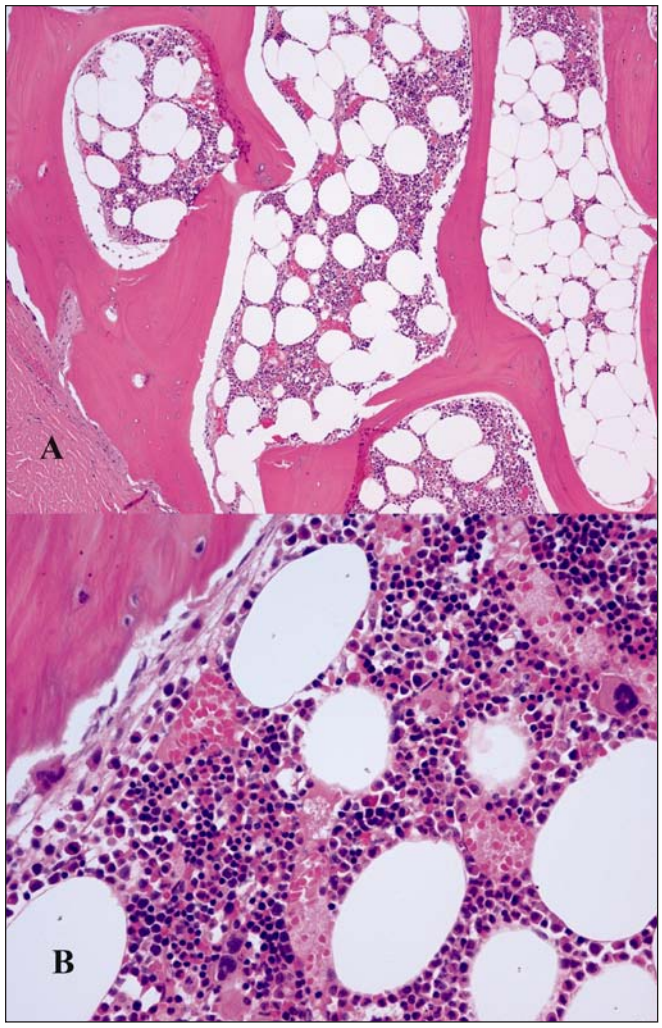

Fig. 2. (**A**) Microscopic appearance of the specimen showing cortical bone, bone trabeculae and bone-marrow elements (hematoxylin–eosin stain, original magnification × 40). (**B**) High-power view shows the presence of bone-marrow elements comprising erythroid, lymphoid and myeloid elements, and megakaryocytes (hematoxylin–eosin stain, original magnification × 100).

References

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