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A delayed foreign body granuloma associated with polypropylene sutures used in tendon transfer. A case report



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ABSTRACT

INTRODUCTION: A delayed foreign body reaction to polypropylene sutures has not been previously reported following tendon repair.

PRESENTATION OF CASE: A 12-year old boy underwent tendon transfer. Tendon repair was done using polypropylene sutures. Five months later, a slowly growing granuloma was seen at the tendon repair site. Skin testing did not show an allergic reaction to the suture. Excision of the granuloma and removal of sutures were curative. Histology confirmed a foreign body granuloma.

DISCUSSION: A mass developing several months at the site of tendon repair indicates either an allergic or foreign body reaction to the suture. Skin testing (for allergy) and histological examination of the mass differentiate allergic from foreign body reactions.

CONCLUSION: We report on a rare case of a giant granuloma caused by a delayed foreign body reaction to polypropylene sutures used in tendon repair.

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1. Introduction

There are 2 different types of delayed reactions to sutures used in tendon repair: allergic and foreign body reactions. Allergic reactions are hypersensitivity reactions either to the suture material or to the dye coating the suture. Allergic reactions to sutures used in tendon repairs have been reported with polypropylene [1], polyethylene [2], braided polyester [3], and suture anchors [4]. Delayed foreign body reactions to sutures have been reported following tendon repairs using polyester [5–7], polyethylene [8], and polyglactin [9] sutures as well as poly-lactide suture anchors [10].

In this paper, we report on the first delayed foreign body granuloma associated with polypropylene sutures in tendon repair. We also aim to guide the hand surgeon to differentiate between delayed allergic reactions and delayed foreign body reactions to sutures used in tendon repairs.

2. Presentation of case

A 10-year old boy sustained a glass laceration to the left proximal forearm resulting in posterior interosseous nerve palsy. The patient

presented to our clinic two years later and underwent tendon transfer (flexor carpi radialis to extensor digitorum; and palmaris longus to extensor pollicis longus). Dyed 3/0 polypropylene sutures were used for tendon repair and polyglactin sutures were used for skin closure. The patient did well and was able to fully extend the thumb and the fingers with the wrist in neutral position. Five months after surgery, a slowly growing granuloma was noted at the site of tendon repair at the dorsum of the wrist. The patient presented to us two month later with a 3 × 5 cm granuloma (Fig. 1A). There was no change in the functional result of the tendon transfer procedure. There was no fever or lymphadenopathy. Complete blood count, C-reactive protein and erythrocyte sedimentation rate were normal. Our working diagnosis was either an allergic reaction or a delayed foreign body reaction to the dyed polypropylene sutures used for the tendon repair. Testing for allergy was done using two 4/0 polypropylene sutures (one dyed and one undyed) sutured into the skin of the arm. However, no allergic reactions were seen (Fig. 1B). Exploration under general anesthesia was done. The granuloma was found to surround the polypropylene sutures (Fig. 1C). The granuloma was excised and all sutures were removed (Fig. 1D). Biopsies were taken for bacterial and fungal cultures as well as for histological examination. The skin was closed using polyglactin sutures (Fig. 1E). The patient was put in a splint (for 3 weeks) to keep the wrist in 30° of extension, the thumb ray in full extension and palmar abduction, and the metacarpo-phalangeal joints of the fingers in 10° of flexion. All cultures were negative. Histological

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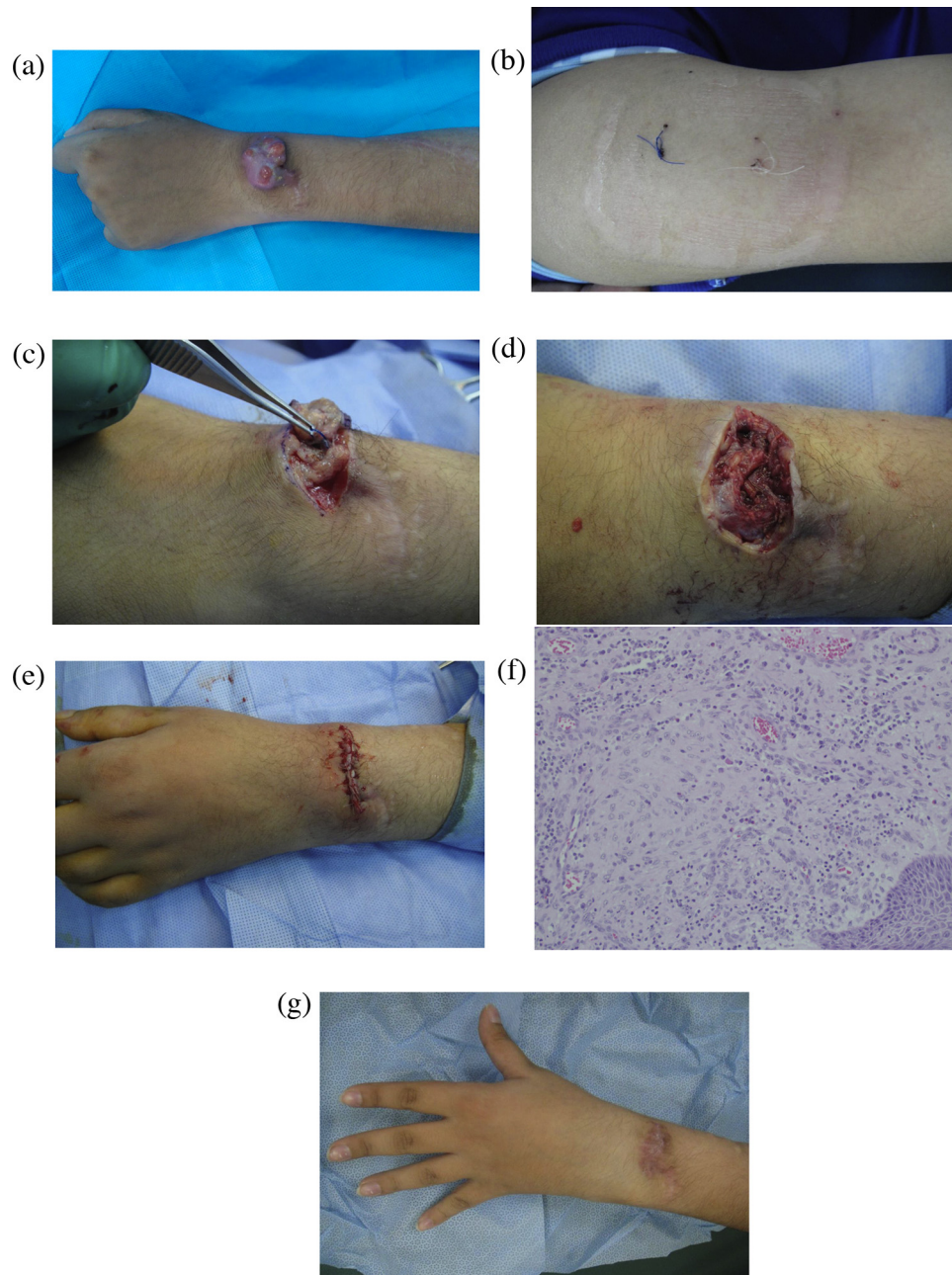


Fig. 1. (a) The granuloma at the site of the dorsal wrist scar. (b) Negative allergic reaction to dyed and undyed polypropylene suture in the arm. (c) The granuloma is seen around the sutures. (d) Appearance after excision of granuloma and removal of sutures. (e) Primary closure of the wound using polyglactin sutures. (f) Histology showing giant cells as well as acute and chronic inflammatory cells (Hematoxylin and Eosin stain $\times 10$). (g) At 10 months, there is no recurrence of granuloma. Note the ability to fully extend the digits with the wrist in neutral position.

examination showed giant cells and some acute and chronic inflammatory cells consistent with a foreign body granuloma (Fig. 1f). The wound healed well. At final follow-up (10 months later), the functional recovery of the original tendon transfer remained stable and there was no recurrence of the granuloma (Fig. 1g).

3. Discussion

Our report has several unique features. The delayed foreign body reaction was to polypropylene and our literature review revealed allergic reactions [1] (or not foreign body reactions) to polypropylene used in tendon repairs. Other cases of reactions to polypropylene were also reported in the nose [11] and conjunctiva [12,13]; although the type of reaction was not specifically

investigated. Our case was also unique because it occurred in a child following a tendon transfer procedure. Previous cases were reported in adults following repair of lacerated or avulsed tendons. It is important to realize that the results of tendon transfers are dependent on tension of the repair. The presence of a suture granuloma as well as excision of the granuloma may stretch the tenorrhaphy site and this may affect the tension of the repair. Hence we maintained the patient in wrist and digital extension for 3 weeks after surgery.

The hand surgeon should differentiate between delayed allergic and delayed foreign body reactions to sutures used in tendon repair. The most two important differentiating features are skin testing and histology. A positive skin test is seen only in allergic reactions. Histologically, allergic reactions show abundance of lymphocytes,

only few polymorphonuclear cells, and no giant cells. Delayed foreign body reactions show giant cells and a mixture of acute and chronic inflammatory cells

Outside the upper limb, reactions to sutures have been misdiagnosed as an abscess [11] or a tumor [12,13]. In upper limb surgery, reactions to sutures used in a tendon repairs have also been misdiagnosed as a sarcoma [6] and excessive subcutaneous fibrosis [1]. A giant skin granuloma at the site of tendon repair should be considered as a suture reaction until proven otherwise. Other than suture granulomas, giant skin granulomas of the hand are also known to be caused by human herpes virus-8 (HHV-8), the gram negative bacteria Bartonella, and the Orf virus. The former infection is known as pyogenic granuloma-like Kaposi sarcoma and definitive diagnosis is made by polymerase chain reaction showing the HHV-8 [14]. Bartonella granulomas are usually seen in AIDS patients and are known as bacillary angiomatosis. Definitive diagnosis is made by the presence of purplish clumps of bacilli histologically [15]. Finally, Orf is a zoonotic viral infection caused by a parapox virus [16]. The infection is usually transmitted to humans from sheep while slaughtering of sheep. The diagnosis of Orf is usually made clinically and may be confirmed by electron microscopy, serum titers or polymerase chain reaction [16].

4. Conclusion

A rare case of a giant granuloma caused by a delayed foreign body reaction to polypropylene sutures used in tendon repair is reported. The differential diagnosis of allergic reactions to sutures is discussed as well as other causes of giant granulomas in the hand caused by viruses and bacteria.

Conflict of interest

None.

Consent

Written informed consent was obtained from the parent of the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by Editor-in-Chief of this Journal on request.

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Ethical approval

The study was approved by the research committee, National Hospital (Care), Riyadh, Saudi Arabia.

Author contribution

All authors contributed significantly and in agreement with the content of the manuscript. All authors participated in data collection and in writing of the manuscript. M. M. Al-Qattan did the surgery and H. Kfoury reported on the histopathology.

Guarantor

M. M. Al-Qattan.

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