

Wound Dehiscence and Calcaneal Infection Complications following Reaction to Suture Anchor System

Introduction & Discussion

Introduction

Soft tissue fixation of ligaments and tendons in the foot and ankle is commonly achieved via metal or bio-composite suture anchors. There are some distinct advantages to the bio-composite anchors including: lack of interference in magnetic resonance imaging, resorption of anchor, replacement of anchor by bone, and no need for hardware removal.

Complications associated with bio-composite anchors are well documented, particularly in shoulder literature, but reports are limited regarding foot and ankle complications.

This descriptive analysis study presents the surgical management of four patients that experienced post-operative wound dehiscence and subsequent calcaneal infection following reaction to a bio-composite anchor system.

Methodology & Procedure

Four patients are presented who underwent retro-calcaneal exostectomy with Achilles tendon repair, using an anchor system (Arthrex Speedbridge). Each patient went on to have surgical site dehiscence and develop a chronic wound.

Following a course of conservative therapy and wound care, patients each underwent surgical debridement and explantation of the anchor system secondarily. Minimum follow-up for the group with 16 months.

Results

All cases failed to obtain complete closure of the initial post-surgical incision site due to chronic serous drainage. Each patient underwent explantation of the anchor system at average of six months from initial placement (range 2-9 months).

Surgical cultures demonstrated infection in each case and included: streptococcus agalactiae, proteus mirabilis, staphylococcus aureus, and pseudomonas aeruginosa. Intra-operative examination of the bone demonstrated osteolysis of the bone immediately surrounding the anchors. Infectious disease consultations in these cases required long-term IV and oral antibiotics for presumed osteomyelitis. At last clinical follow-up, one patient did not have wound closure at 16 months.

Analysis

Studies demonstrate that suture anchors provide equivalent biomechanical strength to past techniques, such as bone tunnels and/or buttons^{1,9}. The theoretical advantage of the bio-composite material is lack of MRI interference, resorption of the anchor, replacement of the anchor with native bone, and no need for hardware removal. Currently, there are several generations of suture anchor materials and none seem to be exempt from provoking an inflammatory response.

Historically, reported rates of clinically significant inflammatory reaction to bio-composite implants range from 0% to 47%^{3,4,10}. One case in particular, described anchors used for a rotator cuff repair and a superior labral repair⁷. Only the cuff repair led to extensive osteolysis and it was theorized that an anchor with mechanical loading, such as with the Achilles tendon, could be more prone to osteolysis and complications. Reaction to foreign material from this suture anchor system can have notable wound healing complications leading to calcaneal osteomyelitis.

Risks associated with system use should be better characterized, particularly in regard to potential foreign body reaction.

References

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Case Study 1

History:

70 year old female with a two year history of a painful bump to the back of her right heel that develops blisters. One previous exostectomy performed two years prior at outside location. Medical history is significant for Rheumatoid arthritis.



Pre-operative radiographs



Immediate Post-op retro-calcaneal exostectomy and Achilles tendon reattachment



2 Weeks Post-Op – Surgical site macerates and dehiscence



2 Weeks Post-Op – Radiographs are negative for signs of osseous erosion or abnormality.



5 Weeks Post-Op – After local wound care, dehiscence site developed erythema, edema and increased drainage. Patient was admitted for IV antibiotics.



8 Weeks Post-Op – Patient was taken to the OR and suture anchor was removed in several pieces. Some purulence was noted medial to the calcaneus with a tract leading to the bone. Micro testing revealed positive results for P. Mirabilis and GBS. Pathology was negative for signs of OM.



10 Weeks Post-Op – Patient underwent routine healing following removal of hardware.

14 Months Post-Op – At last clinic visit patient's surgical site was completely healed with no signs of dehiscence or continued infection.

Case Study 2

History:

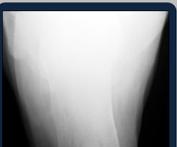
61 year old male with pain to back of heel starting in 2017. Patient underwent NSAIDs, Medrol dose pack, stretching, heat/ice, topical therapy and physical therapy with no relief.



Pre-operative radiographs



Immediate Post-op retro-calcaneal exostectomy and Achilles tendon reattachment



Immediate Post-op retro-calcaneal exostectomy and Achilles tendon reattachment



2 Weeks Post-Op – Incision site is approximated but is significantly macerated.



3 Weeks Post-Op – Patient fell and was seen in the ED. Radiographs demonstrate normal postoperative changes.



3.5 Weeks Post-Op – Increased bleeding and maceration



Patient's wound completely dehisces. Over the next 7 months local wound care is performed with three attempted primary closures. All of which fail to heal.



7 Months Post-Op – No improvement after local wound care, patient taken for HW removal, only partial removal of the anchor system could be done.



8 Months Post-Op – Patient continued to be seen in clinic where the wound repeatedly dehisces despite another primary closure and regular wound care. Patient was taken back to the OR where the remaining portion of the anchor system was removed. Achilles was reattached using two corkscrew anchors.



20 Months Post-Op – Clinical healing achieved.



20 Months Post-Op – Clinical healing achieved.

Case Study 3

History:

51 year old female patient presented with a history of prior retrocalcaneal exostectomy to her left foot at an outside facility. She experienced an Achilles tendon rupture two months after procedure and was repaired using previously mentioned hardware. Three months after rupture patient underwent a soft tissue debulking procedure. Patient presented to Baylor Scott & White clinic with continued pain requesting further intervention.



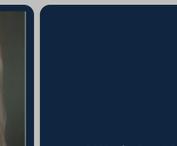
Pre-Surgical X-rays – Patient elected to pursue surgical intervention with calcaneal exostectomy, hardware removal and Achilles debulking.



Immediate Post-Op – The suture anchor was noted to be in several pieces with serous fluid drainage coming from implant site. Hardware was removed and a corkscrew anchor was implanted. Pathology revealed foreign body giant cell reaction with focal necrosis.



4 Weeks Post-Op – Partial wound dehiscence.



6 Weeks Post-Op – Wound had healed upon presentation to clinic.



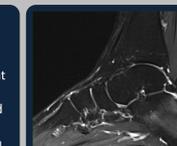
4 Months Post-Op – Patient noticed a blister forming and popped it. A piece of protruding fiberwire was removed in clinic and sent to micro. Resulting culture grew Coagulase negative S. Aureus. Patient was given a course of Bactrim.



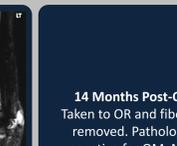
4.5 Months Post-Op – Wound had healed upon presentation to clinic.



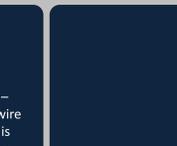
8 Months Post-Op – Patient returned to clinic with a draining sinus tract that had recurred without trauma. Was taken to the OR and an I&D was performed and a superficial abscess was drained. Pathology identified abscess as a foreign body giant cell reaction. Incision healed without complication.



13 Months Post-Op – Patient returns with newly opened wound. MRI reveals abscess formation with fluid surrounding retained suture anchor.



14 Months Post-Op – Taken to OR and fiberwire removed. Pathology is negative for OM. Micro reveals coagulase negative S. Aureus and Finegoldia (Peptostreptococcus) magna.



14.5 Months Post-Op – Sutures intact, well coapted.

Case Study 4

History:

51 year old female patient presented with a history of prior retrocalcaneal exostectomy to her left foot at an outside facility. She experienced an Achilles tendon rupture two months after procedure and was repaired using previously mentioned hardware. Three months after rupture patient underwent a soft tissue debulking procedure. Patient presented to Baylor Scott & White clinic with continued pain requesting further intervention.



Pre-operative radiographs



Immediately Post-Op – Calcaneal exostectomy with Achilles detach/reattachment using previously noted suture anchor system.



3 Months Post-Op – Well healed with no dehiscence or complications.



4 Months Post-Op – Granuloma protruding from incision site.



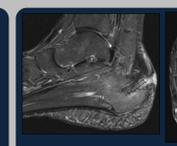
4.5 Months Post-Op – Granuloma removed in clinic.



8.5 Months Post-Op – Patient continued to have pain, swelling and redness surrounding excision site.



8.5 Months Post-Op – MRI reveals extensive surrounding increased signal intensity to left posterior heel, which extends to skin surface from sagittal oriented cleft. Concerning for possible infection.



9 Months Post-Op – Intraoperatively multiple loose fiber tape fragments were removed as well as a fractured suture anchor. Bone samples from suture anchor hole were sent to pathology and micro for analysis which revealed chronic OM with MSSA growth present. Patient subsequently referred to ID for IV antibiotics.



12 Months Post-Op – Incision is healed, at last clinic appointment, after 4 weeks of IV Ancef and Rifampin, followed by 10 weeks of Doxycycline.