

USE OF ACELLULAR DERMAL MATRIX TO PREVENT RECURRENCE OF RADIOULNAR HETEROTOPIC OSSIFICATION

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OBJECTIVES

- Radioulnar heterotopic ossification (HO) is associated with trauma, closed fracture reduction, burns, or central nervous system injury and can result in ankylosis, pain, and decreased ability to pronate/supinate the forearm
- Treatment is primarily surgical complicated by recurrence rates from 5% to 60
- Autologous and non-autologous barriers have been described to prevent recurrence
 - Free fat grafts, Pedicled flaps, silicone, cadaveric tissue, and Integra.
 - Adjuvant medical treatments include NSAIDs and post-operative radiation
- Human acellular dermal matrix (ADM) is a non-autologous biologic material more resistant to infection than non biologic implants
- We report on a new technique using FlexHD® to provide a barrier between the radius and ulna to prevent recurrent formation of heterotopic ossification



ADM construct prepared in a cigar like fashion prior to implantation

METHODS

- Two patients were identified with distal radioulnar heterotopic ossification after undergoing wrist surgery.
- Under axillary block anesthesia, a longitudinal incision was made along the ulnar forearm
- The extensor carpi ulnaris tendon and the ulnar sensory nerve were identified and retracted. The slips of the EDC tendons were elevated, exposing the HO
- Heterotopic bone was resected and fluoroscopy confirmed complete excision. The forearm could now be supinated and pronated without difficulty.
- A piece of Flex HD® acellular dermal matrix was prepared in a cigar fashion and sutured in place between the ulna and radius
- The patients were kept in volar splints for three weeks, at which point therapy was begun.
- Post op evaluation of pronation/supination and radiography was performed



Intraoperative placement of Acellular Dermal Matrix interposed between the radius and ulna

RESULTS

Case 1

A 54 year old female with a history of arthritis, fibromyalgia, and hypothyroidism presented with radioulnar synostosis and the inability to pronate/supinate her right forearm 15 months after a radiocarpal fusion with a Darrach resection.

She underwent resection of the heterotopic ossification with interposition of acellular dermal matrix.

At 20 months follow up she has a significant improvement of range of motion of pronation (60°) and supination (60°), with no evidence of recurrent distal radioulnar synostosis.

Case 2

An otherwise healthy 83 year old female with a history of a ground level fall resulting in a severely comminuted right intra-articular distal radius fracture and a displaced ulnar fracture had an open reduction with internal fixation of the distal radius with a Darrach resection and repair of the dorsal capsule.

At six months, the fracture was well healed but the patient had radioulnar synostosis. The patient had surgical resection of the synostosis and placement of ADM with intraoperative restoration of 45° of pronation and 45° of supination. At 18 months she continues to have a 90 degree total arc of pronation/supination and no recurrence of heterotopic ossification.

CONCLUSIONS

- Flex HD® can be used to prevent recurrence of distal radioulnar heterotopic ossification
- Use of a biologic is theoretically more resistant to infection
- There is no donor site morbidity
- Technical ease of procedure makes reproducibility of results possible with hand surgeons at all levels of experience



Radiographs of Patient 1. Pre-op (left) showing radioulnar heterotopic ossification. Post-op (right) at 20 months showing no recurrence.