

# Composite Regeneration of Fingertip Injuries Using Acellular Bladder Matrix

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## Background

Fingertip injuries are one of the most common reasons for hand surgeon referral. Management strategies range from dressing changes to revision amputation to flap coverage. Complex injuries around the lunula or eponychial fold are often treated surgically, but come at the cost of donor site morbidity or a shortened finger.

We present 10 cases of Allen Zone 3/4 injuries treated surgically using acellular bladder matrix that resulted in composite regeneration of the fingertip.

## Methods

Prospective evaluation of 10 patients referred from Emergency Department

Outcomes Measured:

- # applications
- time to regeneration
- static 2-point discrimination
- fingertip length
- complications
- patient satisfaction (1-10)



## Results

- 10 digits: right thumb (1), right index (2), right long (1), left thumb (2), left index (1), left ring (2), left small (1)
- Mean age: 46.1 years (range 19-78)
- Time to regeneration:  $8.7 \pm 1.5$  weeks
- Avg  $3.2 \pm 0.63$  total applications
- Mean length deficit (compared to the contralateral):  $-3.25 \pm 1.41$  mm.
- Two-point discrimination:  $4.33 \pm 1.36$  mm ( $0.71 \pm 1.14$  mm less sensitive compared to the contralateral)
- Satisfaction from 1 to 10 (10 = most satisfied):  $9.6 \pm 0.76$
- Complications: 1 hook nail deformity, 1 bony exostosis requiring excision



Figure 1. (A) Right thumb Allen 3 amputation just distal to the eponychial fold with exposed bone sustained by a 64-year-old female smoker after getting crushed by a car door. The patient required 3 Acell applications and healed in 6 weeks. (B) At 3 month follow up, a full fingertip with good contour was observed.

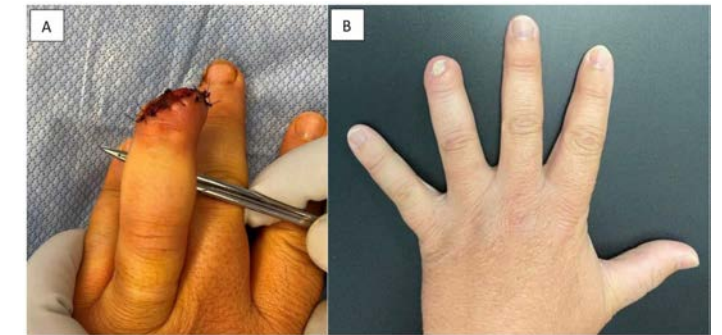


Figure 2. (A) Left ring Allen 4 injury proximal to the eponychial fold which had been initially closed by the emergency department in a 48-year-old nonsmoking male. The wound was opened and the patient underwent 3 total matrix applications which healed in 7 weeks. (B) 3-month follow-up shows partial nail regeneration.



Figure 3. (A) 20-year-old male that sustained a composite Allen 3 amputation from a circular saw at the lunula of the left thumb. This patient underwent 3 Acell applications and healed in 10 weeks. (B) Regeneration of the full thumb tip with nail and good contour was observed at 3 months.

## Conclusions

Acellular bladder matrix is a simple and reliable method of reconstructing complex fingertip injuries, which offers potential for composite sensate and aesthetically pleasing regeneration without the downside associated with traditional methods of reconstruction.

Future directions include a randomized comparison between dressing changes and UBM.

