

Circumferential Adipofascial Graft for Prevention of Recurrence of Posttraumatic Radioulnar Synostosis

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Radioulnar synostosis can cause substantial loss of function, and surgical treatment can be challenging. Recurrence of the contracture related to scar or reformation of the synostosis is problematic. Several techniques have been described for prevention of recurrence. We present a technique utilizing a free wrap around adipofascial graft for interposition and circumferential coverage of the ulna after resection of the heterotopic bone. We believe this technique has the advantages of technical simplicity, secure interposition, and reliable outcomes. (*J Hand Surg Am.* 2017; ■(■):1.e1-e6. Copyright © 2017 by the American Society for Surgery of the Hand. All rights reserved.)

Key words Radioulnar synostosis, adipofascial graft, forearm heterotopic ossification.



POSTTRAUMATIC PROXIMAL radioulnar synostosis is a challenging surgical problem. Substantial functional impairment occurs with loss of pronosupination. Resection of scar and heterotopic bone at the site of the pathology can result in clinical improvement at the time of operation. Recurrence of the contracture is common and several techniques have been described to combat this issue.¹⁻⁵ Most involve interposition of tissue at the site of the resection with variable results being reported. However, tissue interposition may have problems of extrusion of the interposed tissue, incomplete coverage of the resected area, and loss of motion.

Friedrich et al² retrospectively reviewed 13 cases utilizing allograft or autograft tensor fascia lata as an interposition material. Autograft was initially the

tissue of choice; however, owing to donor site issues, this was abandoned and allograft was utilized. Excellent results were achieved with 115° of improvement in pronosupination. Utilizing a similar technique, Pfanner et al⁴ reported on 2 cases utilizing fascia lata allograft for interposition. At 2 years' follow-up, they reported maintenance of full range of motion restored at the time of surgery. Both of these series require use of allograft tissue and an extensive period of orthosis wearing and a rehabilitation protocol.

Jupiter and Ring³ reported on 17 patients treated for posttraumatic radioulnar synostosis. In their series, 8 patients were treated with free fat grafting; however, they abandoned this technique after the graft dislodged into the subcutaneous tissues.

Daluiski et al¹ reported on 23 patients who underwent anconeus flap interposition after resection of proximal radioulnar synostosis resection. An excellent clinical result was obtained at a mean follow-up of 57 months, with an increase in the pronosupination arc of 111°. The limitations of the anconeus flap are inherent in the pedicle location and length and the size of the flap. For lesions distal to the proximal forearm and elbow, the anconeus flap may not be a suitable flap for interposition.⁶

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Received for publication February 1, 2017; accepted in revised form September 17, 2017.

No benefits in any form have been received or will be received related directly or indirectly to the subject of this article.

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0363-5023/17/ ■ ■ -0001\$36.00/0
<https://doi.org/10.1016/j.jhssa.2017.09.010>



FIGURE 1: Heterotopic bone in interosseous membrane is resected.

More recently, Sonderegger et al⁵ reported on 6 cases utilizing pedicled adipofascial flap interposition. Flap design was dependent on arterial anatomy of each patient and location of incisions from prior surgeries and those needed for synostosis resection. At 32 months' follow-up, an excellent 141° arc of motion was maintained. This technique may require multiple approaches and relies on the arterial anatomy of a previously traumatized forearm, which may not always be reliable.

We present a technique for prevention of recurrence of radioulnar synostosis with a readily available substance for interposition that is not technically difficult to harvest. This free adipofascial graft allows complete coverage of the resection bed because it may be fashioned to the desired size based on the area of synostosis resection. There is no limitation based on pedicle length or the longitudinal location of the ulna requiring interposition. We aim to prevent extrusion or migration of the graft by securing circumferential coverage of the exposed ulna. This technique provides an alternative to the previously described techniques that can be easily employed without the need for additional resources or planning.

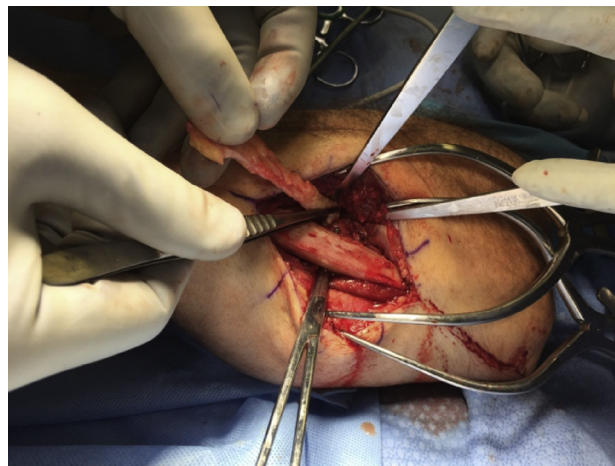


FIGURE 2: Adipofascial graft is harvested.

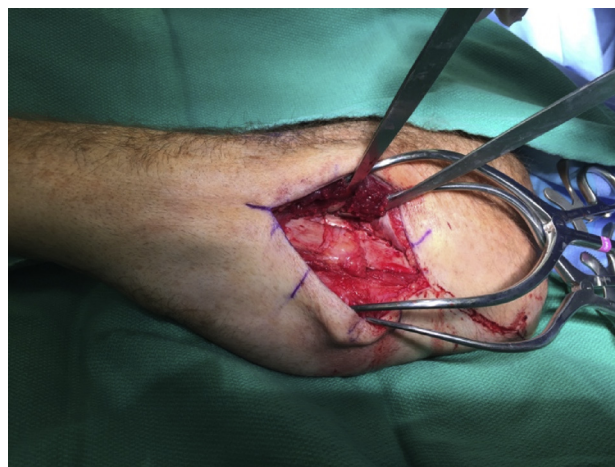


FIGURE 3: Adipofascial graft is wrapped circumferentially around the ulna and sutured to itself as well as to the periosteum of the ulna.

INDICATIONS AND CONTRAINDICATIONS

This technique is indicated for patients who have developed posttraumatic radioulnar synostosis that substantially limits pronosupination. This technique should not be performed prior to maturation of heterotopic ossification, typically as early as 6 to 12 months after injury.

SURGICAL TECHNIQUE

With the patient under regional anesthesia with sedation, the forearm is approached via the subcutaneous approach to the ulna at the flexor carpi ulnaris–extensor carpi ulnaris interval. Dissection is carried out sharply to the level of the muscle fascia, which is incised in the flexor carpi ulnaris–extensor

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