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Advances in Surgical Techniques for Managing Rheumatoid Arthritis and Related Musculoskeletal Conditions

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Introduction

Rheumatoid Arthritis (RA) often leads to a variety of severe hand deformities, necessitating surgical interventions such as synovectomy, tenosynovectomy, tendon surgery, arthroplasty and arthrodesis. Hand surgery plays a crucial role in managing RA patients and surgeons trained in these techniques should be integral to the arthritis management team, rather than being seen as a last resort. The advent of reliable vascular and microvascular anastomosis techniques has made it possible to salvage upper limbs severely deformed by RA. However, these salvaged limbs often yield poor functional outcomes. The quality of skeletal fixation significantly influences functional results and should be a key focus in limb repair. Internal plate fixation is generally safe in severe upper limb injuries if all devitalized tissue is debrided and if necessary, reconstructed using microvascular tissue transfers.

Description

Upper limb salvage techniques

This method facilitates wound care and limb mobilization without tethering muscle-tendon units. Proper identification and treatment of injury patterns, especially those involving ligament injuries to the elbow or forearm, are essential. Internal fixation should restore anatomical alignment and provide sufficient stability to allow for early active mobilization without further devascularizing the soft tissues or skeleton. A study analyzing 42 cases of constriction band syndrome and 27 cases of transverse deficiency aimed to differentiate between the clinical characteristics of amputations caused by these conditions. All transverse deficiencies were unilateral. In contrast, constriction band syndrome amputations often co-occurred with similar conditions in other body parts. Pectoral muscle absence was found in two cases of transverse deficiency. Transverse deficiency required more proximal amputation than constriction band syndrome. Rudimentary fingers and/or nails were rare in constriction band syndrome but common in transverse deficiency. Bone hypoplasia of adjacent fingers or a proximal part of the affected limb was present in transverse deficiency but absent in constriction band syndrome.

Kienbock's disease

An arthroscopic examination was performed on 32 wrists of 32 Kienbock's disease patients to correlate the appearance of intraarticular structures, particularly the articular cartilage, with the radiographic stage. Stage III showed osteoarthritic changes in the articular cartilage not visible on plain radiographs. Cracking in the distal feature and fluttering at the proximal feature of the lunate were identified as characteristics of Kienböck's disease. Changes in triangular fibrocartilage were correlated with age and ulnar variance, while the incidence of interosseous ligament tears correlated with the radiographic stage. Wrist arthroscopy is a valuable tool for staging Kienbock's disease, providing crucial information about intraarticular pathoanatomy to guide patient management. A prospective and long-term evaluation of the Schultz metacarpophalangeal joint implant, a cemented prosthesis with a ball-in-socket articulation, was conducted. Thirty-six implants were followed for an average of 10.9 years. Over time, ulnar deviation returned and range of motion and strength decreased. The neck of the proximal phalangeal part cracked in 39% of the joints. Periarticular heterotopic bone formed in all joints but was extensive in only 22%. Although some lucency of the bone-cement interface was observed in 80% of the joints, no prosthetic loosening occurred in this series. These findings suggest that intramedullary cement fixation of relatively long-stemmed components may be satisfactory for a long time. However, the articulated portion of this implant does not provide long-term joint stability and does not consistently withstand the stresses transmitted across the joint. Four "third-generation" suture anchors were compared to the traditional transosseous suture repair of rotator cuff tendons. The study found that the chosen repair construct significantly influenced failure at ultimate load (p=0.005). The Statak design was significantly stronger than the other three tested anchors. Additionally, the Superanchor, Statak, and Harpoon designs were all significantly stronger than the Revo screw. The strength of repairs made with the Statak, Harpoon or Superanchor was comparable to the transosseous suture method. However, the transosseous suture method had a significantly higher level of strength than repairs made with the Revo.

Conclusion

This study concludes that the design of suture anchors has advanced to the point where the initial fixation strength of torn rotator cuff tendons is comparable to more traditional methods using only sutures. In summary, advancements in surgical techniques and tools play a significant role in the management of complex orthopedic and rheumatologic conditions. Effective management of these conditions requires a multidisciplinary approach and continuous evaluation of the surgical methods to ensure the best functional outcomes for patients.