**RESULTS:** A total of 56 studies were included in final analysis. The most common diagnosis was osteosarcoma (35.1%) and the most common recipient site was the humerus (57.3%) followed by the radius (36.2%) and ulna (5.8%). FVFG had a median union rate of 93.3%, with the median time to union being 5.0 months. The most common complications were fracture (11.7%), nerve injury (7.5%), infection (5.7%), and hammer toe deformity (3.3%). The reoperation rate was 34.5%. The most commonly reported standardized assessment of clinical outcomes following treatment was the Musculoskeletal Tumor Society Score, which had a mean of 79% and a median of 80% postoperatively.

**CONCLUSION:** FVFG in the treatment of malignant bony neoplasms of the upper extremity has a high rate of union and good overall outcomes; however, postoperative complication rates are high. A greater degree of standardization is needed in the reporting of patient-centered outcomes. Reporting outcomes of individual patients or stratifying data based on diagnosis, graft site, and age would facilitate future comparative studies.

**Fascicular Turnover Flap Repair in Peripheral Nerve Defects; An Experimental Study**

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The main problems of treatment of peripheral nerve injuries are donor morbidity, long healing time and functional results as a quality of healing. Since the peripheral nervous system is divided into two as the somatic and autonomous nervous system. In case of any defect, the motor, sensational or autonomous functions of the relevant nerve are partially or completely lost. The aim of microsurgical reconstruction is proper coaptation with tensionless primary end-to-end nerve repair. The gold standard in the presence of nerve defect is autogenous nerve graft. Although current fine techniques are used, lack of functional motor and sensory healing achievement remains unsolved. The rate of returning to work after the common ulnar and median nerve injuries is presented as approximately as a ratio of 60%. To eliminate the donor morbidity, nerve conduits and nerve allografts have been used as an alternative to the autogenous nerve graft. Further, nerve transfers have been offered and used in the treatment of the diseases caused by nerve defects.

In this research, fascicular turnover flap repair conducted with the fascicular dissection from the healthy part of the defected nerve together with the intra-fascicular bindings in the peripheral nervous system and the contribution of this method to motor healing were evaluated in an experimental study.

Twenty-eight male Sprague-Dawley adult rats were used. The animals were grouped under 4 categories with 7 animals in each. A critical defect of 1 cm was formed on the right sciatic nerve of the animals. The defect was not treated in Group A, treated with autologous nerve graft in Group B, and fascicular turnover flap reconstruction from distal stump was performed in Group C and bilateral in Group D. According to the behavioristic, electro-physiologic and histopathologic evaluations; Groups C and D were found to be superior to Group A, whereas they showed no difference from Group B.

According to our study the fascicular turnover flap method was observed as successful.

**Key Words:** nerve, peripheral nerve, defect, flap, fascicular flap, turnover, reconstruction, microsurgery, electrophysiologic, rotate test, beam test, walking test,

**Heterodigital Adipofascial Turnover Flap - Systematic Review of Indications, Techniques and Outcomes**

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**PURPOSE:** The Heterodigital adipofascial turnover flap, also known as the reverse cross-finger flap was first described in 1978. This flap has been used for soft tissue coverage of a variety of dorsal digital defects including nail bed injuries, extensor tendon injuries and open fractures. The purpose of this study is to systematically review
the specific indications, surgical techniques and common reported outcomes to guide clinical management.

MATERIALS AND METHODS: This review was constructed in accordance with Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement. A comprehensive literature review of articles indexed to PubMed was performed using the keywords “turn-over”, “reversed”, “hinged”, “open book”, “cross finger”, “transdigital”, “heterodigital”, “adipofascial”, “dermal”, “de-epithelialized” and “flap”. Two independent reviewers screened the abstracts with regards to exclusion criteria which consisted of non-digital flaps, homo-digital flaps, classical cross finger and non-adipofascial flaps. Selected manuscripts were analyzed in full text with regards to references and citations in order to expand the number of relevant articles. Independent data extraction was performed by two reviewers utilizing pre-determined study characteristics and outcomes. These characteristics included, patient demographics, defect characteristics, clinical diagnosis, surgical technique, duration of follow-up, post-operative protocol such as immobilization, time of flap division, and methods for adipofascial flap and donor site coverage. The prevalence of these characteristics was calculated to summarize indications, surgical techniques and common reported outcomes.

RESULTS: Our search in PubMed using the above-mentioned keywords resulted in 266 articles. 23 of these articles met the inclusion criteria, yielding 163 patients treated with the heterodigital adipofascial turnover flap. Traumatic injury was the most common indication for treatment (n=144). This flap was commonly used from the adjacent digit from extensor zone 2 or 4 (n=95). In 62 cases, the flap was de-epithelialized. 23 cases involved the nail bed, with 17 left to epithelialize and 6 cases covered with a toe nail bed graft. Post-operatively, digits were most commonly immobilized with a splint (n=88). The mean follow up time was 6 months. Complications included, cold intolerance (n=14), incomplete graft take (n=12), stiffness (n=8), infection (n=6), epidermal inclusion cyst (n=3), tendon adherence (n=1) and complete flap necrosis (n=1).

CONCLUSION: The Heterodigital adipofascial turnover flap is an excellent option for coverage of a variety of dorsal digital defects. The surgical technique utilizes an adipofascial turnover flap most commonly from zone 2 or 4 of adjacent finger. This method has a variety of applications for both traumatic and non-traumatic injuries. Donor site morbidity is rare and functional outcomes are promising. The Most common complications are cold intolerance and incomplete graft take.

REFERENCES:
1. Pakiam AI. The reversed dermis flap. British Journal of Plastic Surgery. 1978;31(2):131–135.
2. Al-Qattan MM. The Cross-Digital Dorsal Adipofascial Flap. Annals of Plastic Surgery. 2008;60(2):150–153.
3. Atasoy ECF. The Reverse Cross Finger Flap. The Journal of Hand Surgery. 2016;41(1):122–128.
4. Al-Qattan MM. De-epithelialized Cross-Finger Flaps Versus Adipofascial Turnover Flaps for the Reconstruction of Small Complex Dorsal Digital Defects: A Comparative Analysis. The Journal of Hand Surgery. 2005;30(3):549–557.

Carpal Bone Osteomyelitis after IV Drug Abuse

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INTRODUCTION: Carpal bone osteomyelitis was a rare problem until the recent epidemic of intravenous drug abuse and we now frequently treat abscesses of the hand and wrist. Delayed presentation with suppurative wrist arthritis and carpal bone infections is common in our institution. There is scant guidance literature (PubMed) about human carpal osteomyelitis so we present our experience to these challenging infections.

MATERIALS AND METHODS: From 2015 to 2018, (732) patients presented to our Level 1 Trauma Center with severe infections of the hand, wrist or forearm. Lacerations, animal bites, injection of illegal substances (IVDA) led to infections severe enough to require admission and intravenous antibiotics, with or without surgical I&D. Nine (9) IVDA patients were found to have wrist joint infections that presented as or developed into developing osteomyelitis of one or more carpal bones. Cellulitis was initially treated with high dose antibiotics but with demonstrated osteo aggressive intraoperative I&D, and sequential irrigating wound VAC dressings were employed. Imaging including MRI and wrist CT scan were useful in diagnosing ambiguous bony involvement. Debridement of infected bone was required. Definitive IV antibiotics based on culture results was instituted for 6–10 weeks in most cases.