(18)

# 手及手腕傷害之手術治療及重建

## Surgical Intervention for Treatment or Reconstruction of Injury of Wrist and Hand

時　　間：114 年 6 月 28 日(星期六) 13:30~17:30
地　　點：臺北榮民總醫院 中正 18 樓會議室

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| ***13:30-13:40*** | ***Opening Remarks*** | 王榮礽醫師<br>Jun-Pan Wang |
| | **座長：王榮礽 醫師 (Jun-Pan Wang)** | |
| 13:40-14:20 | 三角纖維軟骨複合體，尺側手腕疼痛的潛在原因；從解剖構造、診斷到治療<br>TFCC-The Potential Cause of Ulnar Wrist Pain: From Anatomy Diagnosis, to Treatment | 陳威仁醫師<br>Wei-Jen Chen |
| 14:20-15:00 | 舟狀骨骨折、骨折不癒合及關節塌陷之關節鏡治療策略<br>Arthroscopic Strategy of Treatment of Scaphoid Fracture, Nonunion, and Advanced Collapse | 黃意超醫師<br>Yi-Chao Huang |
| ***15:00-15:30*** | ***Coffee Break*** | |
| | **座長：黃意超 醫師 (Yi-Chao Huang)** | |
| 15:30-16:10 | 臺北榮民總醫院手外科骨折的微創手術經驗<br>Minimally Invasive Treatment for Hand Fracture: TVGH Experiences | 王榮礽醫師<br>Jun-Pan Wang |
| 16:10-16:50 | 重新詮釋骨質疏鬆性上肢骨折：從預防到治療的全方位策略<br>Reframing Upper Limb Fractures in Osteoporosis: A Comprehensive Approach from Prevention to Treatment | 黃惠鑛醫師<br>Hui-Kuang Huang |
| 16:50-17:30 | 橈骨延長術對遠端橈尺關節穩定性影響之生物力學大體研究<br>Effect of Radial Lengthening on the Dtability of the Distal Radioulnar Joint: A Biomechanical Cadaveric Study | 殷震宇醫師<br>Cheng-Yu Yin |
| ***17:30-17:40*** | ***Closing Remarks*** | 黃意超醫師<br>Yi-Chao Huang |

# TFCC- The potential cause of ulnar wrist pain: From anatomy diagnosis, to treatment

# 三角纖維軟骨複合體，尺側手腕疼痛的潛在原因；從解剖構造、診斷到治療

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TFCC is an important and complex structure as its name suggests. It plays not only as a cartilaginous structure in its central disc to transmit the load through the wrist but also as a ligamentous structure in its peripheral portion to stabilize both ulnocarpal joint and distal radioulnar joint (DRUJ); meanwhile, TFCC lesion is also one of the major causes of ulnar-sided wrist pain. However, diagnosis of the TFCC lesion can be challenging. Detailed history taking and physical examinations are fundamental to provide some traces of clue about the TFCC problems. MRI is the a powerful tool to delineate the structure but the interpretation of the images depend on not only high a resolution MRI machine but also an experienced staff. So, arthroscopy remains the gold standard for the diagnosis of TFCC lesions because the TFCC morphology could be directly visualized and evaluated from both radiocarpal arthroscopy and DRUJ arthroscopy.

Regarding the treatment for TFCC lesions, it should be tailored according to the type and the location of the tear. Palmer classification provides a useful treatment guideline. Palmer class 1 lesions refer to the traumatic lesions. Tear involving the disc portion could be treated non-operatively initially and had been shown to do well with arthroscopic debridement if failed with non-operative treatment. Traumatic peripheral tear at either ulnar, carpal, or radial insertion may result in instability of the ulnocarpal and the distal radioulnar joints. Thus, surgical repair to restore the TFCC anatomy is reasonable to restore the stability of the ulnocarpal and DRUJ. Palmer class 2 lesions refer to a spectrum of degenerative tears due to the excessive loading of the ulnar wrist. Therefore, unloading of the ulnocarpal joint is the treatment principle for Palmer class 2 lesions. Nonsurgical management should be provided initially. If these modalities fail, ulnar shortening osteotomy or wafer procedure is indicated. A thorough knowledge of the anatomy as well as the Palmer classification helps to guide treatment options.

# Arthroscopic strategy of treatment of scaphoid fracture, nonunion, and advanced collapse

# 舟狀骨骨折、骨折不癒合及關節塌陷之關節鏡治療策略

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Scaphoid fractures are the most common fracture of the carpal bones and account for 60% carpal injuries. Due to anatomical properties including tenuous vascular supply, joint fluid dilution, and the inability to form callus, as well as biomechanical properties, such as high shear stress and displacement of fragments, delayed unions and non-unions are not uncommon. It is known that the nonunion rate of scaphoid fracture is 5–10% with non-surgical treatment.

Wrist arthroscopy, a minimally invasive technique, provides a wider and clearer view in diagnosis in wrist problems with aid of magnification. By using small-sized arthroscopy and fine instruments, arthroscopic surgery preserves native circulation, ligaments and the remaining carpal motion can be maximized with reduced postoperative pain. There is also cosmetic benefit with the minimal surgical scar. Wrist arthroscopy helps to get more accurate evaluation of fracture reduction and concomitant ligament injuries in patients with scaphoid fracture without damage of ligaments. Wrist arthroscopy is also helpful in evaluation of cartilage condition in patient s with scaphoid nonunion with advance collapse. For scaphoid nonunion, curettage to the level of good puncture bleeding and transportation of cancellous bone graft into non-united site can also be done under by wrist arthroscopic technique.

Partial wrist fusion is considered as salvage procedure for advanced stage of scaphoid nonunion with advanced collapse. It is a good alternative way, rather than total wrist fusion, with preservation of some degree of wrist motion, wrist proprioception, and serves as a function-improving procedure. However, it is a technically demanding procedure with a steep learning curve. With proper training in small joint arthroscopy, arthroscopic partial wrist fusion is a valuable option for patients with wrist arthritis to preserve motion and good cosmetic outcome.

# Minimally invasive treatment for Hand Fracture: TVGH experiences

# 臺北榮民總醫院手外科骨折的微創手術經驗

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Various surgical methods have been proposed to correct the deformities resulting from malunion of the proximal phalanx. However, few studies have examined the outcome of corrective osteotomy with combined with flexor tenolysis. We report our experience of treating such cases. (J Hand Surg Eur Vol 2019 Dec;44(10):1091-1092)

Al-Qattan and Al-Qattan have described antegrade K-wire fixation for proximal phalangeal neck fractures in children using a single K-wire. Other authors have advised this technique with two K-wires for other proximal phalangeal fracture types and/or in adults only. We present our results of treating paediatric proximal phalangeal neck fractures with double K-wire antegrade intramedullary pinning. (J Hand Surgery Eur Vol 2019 Mar;44(3):323-325.)

Various treatments have been proposed for fracture dislocations of the proximal interphalangeal (PIP) joint. Among them, dynamic distraction external fixation (DDEF) has become an attractive and favourable surgical intervention for hand surgeons because it allows early active motion and is less invasive to the surrounding soft tissues. However, it would appear to be impractical to use DDEF alone if the fracture-dislocation of the PIP joint has progressed to a delayed stage with partial healing and malunion at the fracture site. Therefore, we present DDEF technique with preliminary percutaneous callus release to manage delayed presentation fracture-dislocations of the PIP joint. (J Hand Surg Eur Vol. 2020 Feb;45(2):195-197.)

# Reframing upper limb fractures in osteoporosis: A comprehensive approach from prevention to treatment

# 重新詮釋骨質疏鬆性上肢骨折：從預防到治療的全方位策略

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Osteoporosis is a progressive disease characterized by decreased bone mass and structural deterioration, leading to an increased risk of fractures. Common fracture sites include the spine, hip, wrist, and humerus. Upper limb fractures are often the earliest clinical manifestation of osteoporosis. Importantly, patients who sustain these fractures face a significantly higher risk for future spine and hip fractures, which carry greater morbidity and mortality. Upper limb fractures serve as early indicators of osteoporosis and may predict more serious fractures, such as those of spine and hip, if underlying bone health is not addressed.

An upper limb fracture should be regarded as a sentinel event necessitating comprehensive evaluation, rather than just localized treatment. A proactive approach requires immediate bone health assessment, including bone mineral density testing, fall risk evaluation, and early initiation of osteoporosis therapy. This shift from reactive to proactive care can greatly reduce the likelihood of subsequent fractures.

Prolia (denosumab), a RANK ligand inhibitor, effectively reduces fracture risk by inhibiting bone resorption and enhancing bone strength. Clinical data indicate that Prolia significantly lowers the risk of wrist fractures by 43%, forearm fractures by 43%, humerus fractures by 58%, and upper arm fractures by 48%. Initiating Prolia treatment after an upper limb fracture is a crucial step in comprehensive secondary fracture prevention.

Effective fracture prevention necessitates more than pharmacologic therapy alone. Combining Prolia with lifestyle interventions—such as calcium and vitamin D supplementation, resistance and balance training, and fall prevention strategies—creates a robust framework for fracture risk reduction. Early, proactive management following an initial fracture helps prevent debilitating spine and hip fractures while preserving patient independence, mobility, and overall quality of life.

# Effect of radial lengthening on the dtability of the distal radioulnar joint: A biomechanical cadaveric study

# 橈骨延長術對遠端橈尺關節穩定性影響之生物力學大體研究

**Cheng-Yu Yin**

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**Background:** The radial lengthening procedure has been clinically proven to treat distal radioulnar joint (DRUJ) instability associated with distal radius fracture. This study evaluated DRUJ stability under varying degrees of radial lengthening and examined whether the distal oblique bundle (DOB) enhances its stabilizing effect.

**Methods:** Eight fresh-frozen cadaver specimens were used. DRUJ translation distances and corresponding recovered stability were measured using a custom stress test machine simulating the DRUJ ballottement test. A triangular fibrocartilage complex (TFCC) injury model was arthroscopically created to induce DRUJ instability. Stress tests were then conducted on injured samples with radial lengthening of 1mm, 3mm, and 5mm, recording translation distances. Finally, anatomic dissections determined the presence of DOB in each sample.

**Results:** Radial lengthening was correlated with decreased translation distance in machine-driven stress tests, though the results were not statistically significant. To address DRUJ stability concerns, we defined recovered stability and found that at least 3mm of radial lengthening improved stability in nearly all wrist positions, with 5mm providing greater benefit in pronation. In our study, the prevalence of DOB was 37.5%, and its presence significantly enhanced the stabilizing effect of radial lengthening on DRUJ stability, as indicated by multiple linear regression models.

**Conclusion:** Radial lengthening may offer advantages in managing DRUJ instability associated with acute distal radius fractures, particularly when the DOB is present. However, alternative treatment strategies should be explored first, as radial lengthening often results in only partial restoration of DRUJ stability.