

Operative Correction of Boutonniere Deformities in the Rheumatoid Hand

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Letter to the Editor

Boutonniere Deformity (BD) is a debilitating deformity where the Proximal Interphalangeal (PIP) joint of the finger is flexed, and the Distal Interphalangeal (DIP) joint is hyperextended. BD is commonly seen after injury and also as a sequela of progressive inflammatory conditions such as Rheumatoid Arthritis (RA) [1-3].

RA is the commonest disorder of connective tissues and is an important cause of disability, morbidity, and mortality. The aetiology of RA remains unclear, but there is evidence of genetic predisposition to the disease, the presence of HLA-DR4 is significantly commoner among sufferers of RA.

RA usually presents as a polyarthritis affecting small joints or small and large joints. If the disease remains active and uncontrolled the inflammation will usually spread to additional joints and gradual irreversible tissue damage will occur, causing deformity and instability of joints.

Inflammation of other synovial structures is common, and a similar process may occur in tendon sheaths, progressing to serious dysfunction and rupture. The typical rheumatoid deformities such as ulnar deviation of the fingers, z- deformity of the thumb, swan neck and boutonniere deformities are mostly due to damage or displacement of tendons [4].

Nalebuff and Zancolli have described classification schemes that characterize the BD and guide of treatment. Nalebuff's system has three stages, based on the passive correctability of the PIP joint flexion deformity and the condition of the articular surfaces of the PIP joint [5]. Stage 1 boutonniere deformity is characterized by synovitis of the PIP joint and a slight fully correctable extensor lag. Stage 2 deformity consists of a marked flexion deformity of the PIP joint that is either flexible or fixed. Stage 3 deformity is characterized by destruction of the PIP joint.

Zancollis [6] distinguished BD in his system; there are two types of BD: those with passively correctable PIP joint flexion and DIP joint extension deformities and those with fixed deformities. As deformities progress from flexible to fix they become far less likely to respond to splinting or soft-tissue reconstructions.

Early BD may be treated nonoperatively with low profile extension splinting of the PIP joint. A mild BD does not usually cause functional impairment, because it does not limit grasp of moderate and large size objects. Synovectomy of the PIP joint may be indicated in a patient with a mild, progressive BD and persistent synovitis that is unresponsive to oral medication or local injection of corticosteroids.

Hyperextension of the DIP joint causes functional limitation when it prevents the volar aspect of the fingertip from coming into contact with an object on digital flexion. Operative correction of a DIP joint hyperextension deformity, a straight forward solution to this problem, is most easily accomplished by section of the terminal tendon over the middle phalanx [7].

Technique of extensor tenotomy, the aim of this tenotomy is to divide the terminal tendon insertion such that the contribution of the conjoint lateral bands to the terminal tendon is divided, but the contribution of the oblique retinacular ligament to the terminal tendon is preserved [7,8]. A slight mallet deformity may occur after the tenotomy, but this is usually well tolerated. If the mallet deformity is significant the DIP joint is splinted for 4-6 weeks in extension. If this does not correct the mallet deformity a fusion of the DIP joint can be considered [9].

Central Slip Reconstruction, for more severe BD in which there is a well preserved PIP joint cartilage (Nalebuff stage 2 deformities); central slip reconstruction by means of an anatomic technique as advocated by Urbaniak [10] and Flatt [11] is indicated. The central band is divided from the insertion onto the base of the middle phalanx leaving a cuff of tissue on the middle phalanx to allow repair later. The central band is separated from the lateral bands proximally, the attenuated distal portion excised, and central band advanced and reattached to the cuff of tissue at the base of the middle phalanx [12]. The lateral bands are mobilized from their volarly displaced position by

releasing the transverse retinacular ligament attachments along the volar margin of the lateral bands. The lateral bands are repositioned dorsally over the PIP joint and sutured to each other [13].

Arthrodesis, if articular destruction is evident or if a severe fixed flexion contracture is present, even without severe articular changes, Arthrodesis of the PIP joint in 25 to 40 degrees of flexion, is a reliable option for managing pain and treating deformity. Flexible implant arthroplasty of the PIP joint combined with release of the terminal extensor tendon is a less reliable option, due to marked attenuation of the dorsal extensor mechanism [13].

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