CHAPTER 2 – SHOULDER INSTABILITY: GLENOID AND HUMERAL-HEAD BONE DEFECT

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2.1 Introduction

Glenohumeral bone loss is one of the most important factors responsible for failure and recurrence after a shoulder arthroscopic instability repair. A high percentage of patients with traumatic, recurrent anterior instability have some level of glenohumeral bone loss. It is necessary to recognize the amount of bone loss preoperatively in order to determine successful management strategies. Standard radiographs may be inadequate for detecting the extent of glenoid and humeral-head bone loss.

Glenoid fractures and bony Bankart should be distinguished from attritional glenoid bone loss in which the injured portion of glenoid bone has resorbed. Two- and three-dimensional computed tomography (CT) are useful for quantitative assessment of glenoid bone loss and can be done using different methods: the true circle method on 2D CT (Pico method) appears most reliable and could be theoretically used without comparison.

Three-dimensional CT is an accurate method for sizing and localizing osteochondral lesions of the humeral head and can be used for grading Hill-Sachs lesions. CT scan with 3D reconstruction is necessary if any bone loss is visible on X-ray or magnetic resonance imaging (MRI). Location is more important than size: Hill-Sachs lesions will only “engage” if they extend medially over medial margin of glenoid rim.

In recent years, many authors focused on the importance of glenoid and humeral bone defects associated with anterior glenohumeral instability. Biomechanical studies showed that glenoid and humeral bone defects can affect normal shoulder kinematics by changing glenohumeral contact forces and reducing resistance to dislocation. Further, clinical studies reported a significant incidence of bony Bankart lesion and Hill-Sachs lesion after first dislocation, a high percentage of glenoid bone loss in chronic instability, and a significant correlation between the amount of glenohumeral bone loss and recurrence rate of instability after surgical treatment. For these reasons, detection and quantification of glenoid and humeral bone defects have implications for treatment choice, and most recent guidelines on the treatment of anterior glenohumeral instability recommend open procedures by bone reconstruction or augmentation when major glenoid and/or humeral bone loss is present.

It is imperative that adequate radiographic imaging be included in workup of patients with recurrent shoulder instability. Glenoid bone loss is the likely number one reason shoulder instability surgery fails. However, with adequate preoperative evaluation of glenoid and humeral-head bone defects, the surgeon may be able to present a more informed decision to the patient regarding overall management and risk of recurrence.

2.2 Glenoid-bone Defect

Glenoid-bone defect and recurrence after stabilization surgery has been reported by several authors. In 1961, Rowe [1] reported an incidence of recurrent dislocation that rose from 6% to 62% if glenoid bone defect was present. In 2000, Burkhart and De Beer [2] analyzed 194 patients operated by the two authors using the same