

Use of preoperative three-dimensional computed tomography to quantify glenoid bone loss in shoulder instability

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摘要

Abstract

PURPOSE: The purpose of this study was to determine if three-dimensional computed tomography (3-D CT) scans of the glenoid can be used to accurately quantify, by means of a glenoid index, bone loss in patients with anterior glenohumeral instability, and to compare the results with arthroscopic measurements to determine if the 3-D CT scan can preoperatively predict which patients with anterior glenohumeral instability will benefit from a bone grafting procedure.

METHODS: From 2003 to 2006, 188 patients with anterior glenohumeral instability underwent arthroscopic evaluation and treatment by the senior author (S.S.B.). Of 188 total patients, there were 25 patients ranging in age from 15 to 43 years (median, 19 years) who underwent 3-D CT evaluations of both shoulders followed by arthroscopy of the unstable shoulder. For an arthroscopically measured bone loss of less than 25% of the inferior glenoid diameter, an arthroscopic Bankart repair was performed; for a glenoid bone loss of greater than or equal to 25%, an open Latarjet reconstruction was performed. We defined the glenoid index as the ratio of the maximum inferior diameter of the injured glenoid compared to the maximum inferior diameter of the uninjured contralateral glenoid as calculated from the 3-D CT scans. If the glenoid index was greater than 0.75, the patient was predicted to benefit from an arthroscopic Bankart repair (the need for surgery and the type of surgery having been determined on the basis of arthroscopic measurements). However, if the glenoid index was less than or equal to 0.75, the patient was predicted to benefit from an open Latarjet procedure. The results of each patient's glenoid index were compared with the arthroscopic decision to perform either an arthroscopic Bankart repair or an open Latarjet procedure. **RESULTS:** Of the 25 patients included in this study, 13 patients underwent an open Latarjet procedure and 12 patients underwent an arthroscopic Bankart repair. The 3-D CT scans accurately predicted the arthroscopic decisions to

perform an arthroscopic Bankart repair or open Latarjet in 24 (96%) of 25 cases (Fisher exact test; $P < .001$). CONCLUSIONS: The glenoid index as calculated from the 3-D CT scan accurately predicted the requirement of a bone grafting procedure for 24 (96%) of 25 patients when the benchmark value of 0.75 was used. The 3-D CT scan can therefore be used by surgeons as an additional diagnostic tool for preoperative planning and patient counseling. LEVEL OF EVIDENCE: Level III, development of diagnostic criteria with universally applied reference (nonconsecutive patients).