

Paper #109

Acetabular Subchondral and Cortical Breach during Labral Repair with Suture Anchors: Influence of Portal Location, Curved versus Straight Drill Guides, and Drill Starting Point

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Summary:

Evaluation of the effect of skin portal utilized, curved or straight suture anchor drill guides, and distance of drill start point from the acetabular rim on subchondral bone or far cortex penetration of drill bit.

Abstract:

Introduction

Iatrogenic chondral injury has been cited as a complication during arthroscopic labral repair. Risk factors contributing to drill penetration include the portal utilized for drilling; position of the drill guide relative to the acetabular rim (on rim, ON; off rim, OFF); and the use of straight (ST) versus curved (CU) drill guides. The purpose of this study was to evaluate the impact of these variables on drill penetration of the acetabular subchondral bone or the far cortex of the acetabulum.

Methods

Sixty sawbone acetabular models were marked at the 3, 2, 1, 12, and 11 o'clock position. Simulated anterior (AP), anterolateral (AL), and distal anterolateral accessory (DALA) portals were created. Twelve groups of five acetabula were drilled at each clock face position: ST/AP/ON; ST/AL/ON; CU/AP/ON; CU/AL/ON; ST/AP/OFF; ST/AL/OFF; CU/AP/OFF; CU/AL/OFF; ST/DALA/ON; ST/DALA/OFF; CU/DALA/ON; CU/DALA/OFF. Penetration of the articular subchondral bone or the far cortex was noted during each drilling.

Results

A total of 38/300(12.7%) drillings perforated the subchondral bone, and 45/300(15%) breached the far cortex. Drilling from the AP, AL, and DALA portal breached the articular subchondral bone 21/100 (21%), 17/100(17%), and 0/100(0%) respectively; and breached the far acetabular cortex 36/100(36%), 1/100(1%), and 8/100(8%) respectively. Drillings with an "On Rim" start point breached the articular subchondral bone 29/150(19.3%) versus 9/150(6%) for drillings with an "Off Rim" start point. Articular surface penetrations were most frequent at the 2 and 3 o'clock positions; far cortex perforations were most frequent at the 11 and 12 o'clock positions.

Conclusion

This study quantifies the relative impact of portal location, drill guide, and starting point on the acetabular rim on acetabular subchondral bone and far cortex penetration. Portal location had the highest impact, with the DALA portal noted to be the safest. Curved drill guides also reduced the number of acetabular subchondral bone

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penetrations. These findings can be used to influence arthroscopic technique during acetabular labral repair.