

Commentary: Tweaking The Fulcrum: Troubleshooting and barriers to implementation of a novel technique for reduction of shoulder dislocations

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Introduction

In “The fulcrum: a novel technique for reduction of shoulder dislocations”¹ my colleague and I describe an effective and relatively painless maneuver for reducing shoulder dislocations. In the interval since publication, I have received feedback from colleagues who have attempted The Fulcrum with variable success, and I have personally encountered challenging cases that required me to troubleshoot and fine-tune the technique. This commentary includes a brief summary of the original article including the rationale for choosing The Fulcrum, as well as points that will help providers optimize their technique when employing it.

The Fulcrum

In our original publication, we describe the Fulcrum technique and three clinical scenarios in which it was employed with success: risk of delay to reduction, the inexperienced clinician, and the difficult to reduce shoulder (in which orthopedic surgeons attempted numerous techniques unsuccessfully before an Emergency Medicine physician joining the case successfully employed The Fulcrum).

The Fulcrum has many similarities to the Cunningham technique as it uses mostly static forces which are gradually applied while the practitioner guides the patient through breathing and relaxation to further minimizes tension, apprehension and pain but adds a fulcrum point to help direct the humeral head around anatomic resistance points. The technique involves using an interlocking forearm grip (Figure 1) which allows for force to be applied in all axes (flexion,



Figure 1: Positioning – note provider is inferior and anterior to the patient as this was an anteroinferior dislocation

extension, axial loading, axial traction, abduction, adduction, and rotation). The clinician’s other arm is placed in the axilla providing a levering point to reduce the deformity with less gross force and minimal movement of the extremity thereby decreasing pain and any resulting muscle tension which makes reduction more difficult. (Figure 2)

Optimization and Troubleshooting

The challenges to this technique are both mental and physical but are easily overcome. The clinician must visualize the anatomy and ensure that forces are applied along vectors that free the humeral head from anatomic structures which block its return to the glenoid. Additionally, the clinician must be patient and help the patient with breathing exercises and even gentle massage to reduce muscle tone which resists reduction.

Positioning is paramount. The clinician should be

somewhat inferior to the patient. This allows the clinician to provide axial traction more effectively while applying adduction force at the elbow and levering anteriorly or posteriorly depending on the type of dislocation.

There is a patient I have encountered several times with recurrent anterior dislocation. My colleagues have attempted The Fulcrum with limited success so on the patient’s next visit I consciously noted what I was doing that allowed the patient what he described as a “painless” unседated reduction: I positioned myself to allow for a variety of force vectors, visualized the anatomy, and once I was confident I was applying optimized force vectors (in this case mostly traction with some adduction with the interlocking arm, and anterior levering with the arm in the axilla), I had the patient breathe and attempt to relax his muscles with each exhalation. The total time for that reduction was under two minutes. (Table 1)

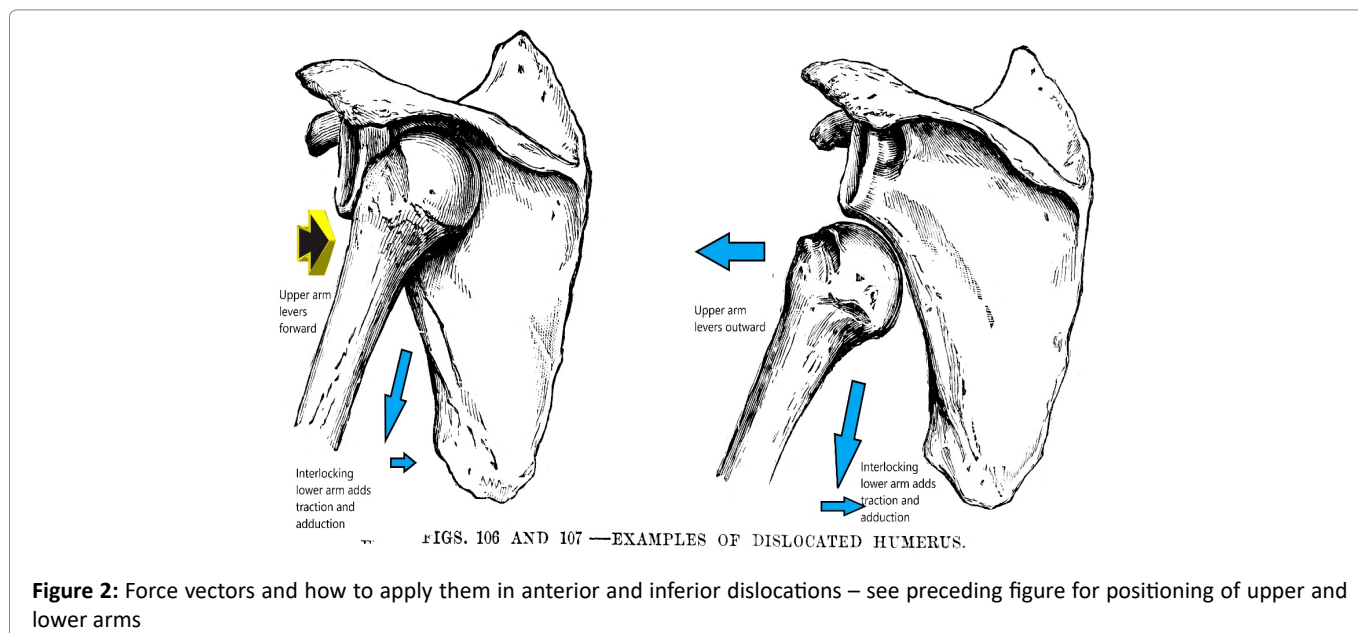


Figure 2: Force vectors and how to apply them in anterior and inferior dislocations – see preceding figure for positioning of upper and lower arms

Table 1: Step-by-step trouble shooting

<p>Positioning</p> <ul style="list-style-type: none"> - Provider should be positioned (relative to the patient) in the direction of the deformity. i.e. For anterior inferior dislocations sit slightly anterior and below the patient’s shoulder
<p>Forces</p> <ul style="list-style-type: none"> - In most cases the initial force vector is axial traction - Sequentially gently add adduction force to the outside of the elbow and use the upper “fulcrum” arm to direct the humeral head - Visualize the direction you want the humeral head to glide before starting <ul style="list-style-type: none"> • For anterior: angle lever arm forward by extending at the elbow • For posterior: angle lever arm posterior by bending at the elbow • Inferior: lever arm perpendicular to frontal plane - Be patient. Once you are confident the forces are appropriate to dislodge and glide the humerus home, maintain those static forces while helping the patient to breath and relax with each exhalation rather than adding more force - Do not apply cephalad force with the lever arm (in axilla) which could cause injury to the axillary nerve
<p>Additional considerations</p> <ul style="list-style-type: none"> - If still unsuccessful, can gently and slowly add external rotation while maintaining the other force vectors - Have the patient’s caregiver or an allied health team member provide massage to improve relaxation - Have the patient squeeze a towel forcefully and then slowly release it with the uninjured hand which may decrease muscle tone in the target shoulder through both distraction and sympathetic relaxation

Implications and Broader Context

There are many techniques described in the literature and ultimately practitioners need to find one with which they develop comfort and a high success rate. Timeliness of reduction, success rate, and patient comfort are of paramount importance in choosing a technique, with time to reduction being the factor most associated with failed reduction³. The Fulcrum has advantages in that the patient keeps the arm immobilized in their pre-existing position of comfort and achieves reduction with almost no net movement of the extremity. On the contrary, most techniques in the literature (including a recently published wrist-clamping and shoulder-lifting technique²) involve straightening and abducting the arm. In the associated video I link to below, the patient keeps his arm in position of maximum comfort and doesn't even notice the humeral head gently glide back into position until his partner exclaims "that's super cool".

Barriers to Implementation

The main barriers I've encountered with colleagues attempting The Fulcrum have been practice inertia (which is understandable given the long wait times and patient volumes that make it difficult to justify working on new techniques), and difficulty visualizing the manipulation based on our descriptions in the original article and

video. When I have been able to teach the technique in the context of an active patient, colleagues and learners have commented on the ease of use and positive patient experience.

My hope is that this commentary update, and associated video will help to broaden adoption of this easy, fast, and painless technique.

Supplementary Material

Supplementary Video S1: Instructional demonstration of "The Fulcrum" technique for reduction of shoulder dislocations.

URL: https://youtu.be/730oa8U_cSY

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