



Assessment of Resident Technical Skill with the Use of a Novel Cubital Tunnel Release Technique

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Introduction

Development of a standardized, validated skills assessment for plastic surgery education can help ensure that graduating residents will possess the minimum knowledge, judgment and technical skills required for safe performance of a core subset of procedures. Previously published work described a structured skills assessment administered to residents of a single orthopedic surgery program. This project aims to illustrate the ease with which a novel cubital tunnel release approach can be taught to novice surgeons as well as describing a validated tool for assessment of surgical skill.



Figure 1. Instruments and cadaveric upper extremity provided for the procedure, including the lighted retractor.

Methods

Ten plastic and orthopedic surgery residents of varying years participated in this study. The technique was presented via Powerpoint format fifteen minutes prior to their examination. The technique was a minimally invasive approach that used the lighted breast retractors (ASSI). After exposure of the cubital tunnel was obtained in a fresh cadaver arm through an approximately 3cm incision, progressively longer lighted retractors were placed to facilitate visualization and decompression of the tunnel and the distal and proximal possible sites of compression. The resident evaluation was performed by a CAQ board-certified hand surgeon. They used a detailed checklist of required steps; a global rating scale; timing; and finally, a dissection to assess for complications. Study data was compared between residents and a rho correlation analysis verified the validity of the assessment tools.

Detailed Checklist: Cubital tunnel release		
Resident Number: _____ Resident Year: _____ Evaluator Number: _____		
Start Time: _____		
End Time: _____		
Item	Not Done or Incomplete	Done Correctly
1. Skin incision centered between medial epicondyle and olecranon approximately 3cm, above approximately 1cm.		
2. No. 11 knife perpendicular to make skin incision perpendicular to skin without flaps or slings.		
3. Applies appropriate pressure for skin penetration without multiple passes.		
4. Makes flap with minimal tissue handling (grasping, re-grasping, tissue trauma etc.)		
5. Incision is completed through the subcutaneous tissue and fascia to identify the ulnar nerve.		
6. The fascia surrounding the ulnar nerve is dissected.		
7. A ligand/retractor is used to dissect the nerve proximally approximately 1cm with visualization of the ulnar nerve.		
8. The cubital tunnel is then entered and released distally also with use of the lighted retractor, visualizing the ulnar nerve.		
9. The forearm fascia is opened and the muscle is bluntly dissected over the nerve.		
10. The elbow is put through a range of motion to test for subluxation.		
11. The resident communicates the resulting operative plan if subluxation is found.		
ADVERSE EVENTS		
Ulnar Nerve Injury	YES	NO
Medial antebrachial cutaneous nerve injury		
Median branch to FCU injury		
Medial ulnar collateral ligament injury		
Incomplete release of cubital tunnel		
Other (specify): _____		
Overall Assessment:		
PASS	FAIL	

Figure 2. Modified Global Rating Scale and Detailed Checklist utilized in resident assessment.



Figure 4. Progressively longer lighted retractors were placed to facilitate visualization of the nerve while releasing all compression sites.

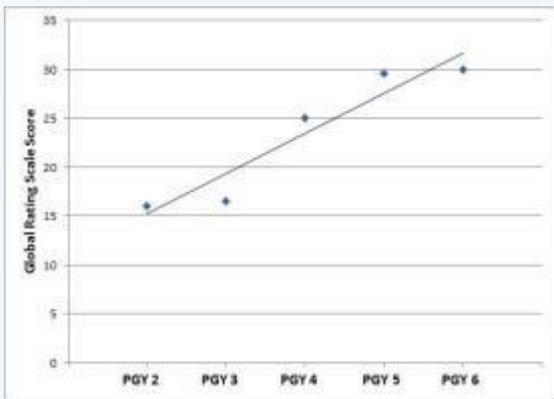


Figure 3. Training year most strongly correlated with result values from the Global Rating Scale assessment (r=0.95, p<0.05)

Results

Validation measurements showed strong correlations between the pass/fail grade and the detailed checklist (r=0.8) and the global rating scale (r=0.6). Training year was most strongly correlated with the global rating scale (r=0.8) and there was a trend towards faster surgical time in the senior resident cohort. Two junior residents obtained a failing grade due to the occurrence of an adverse event, incomplete release. All residents completed a survey which showed all senior residents had prior experience with this procedure however only two had previously performed the lighted retractor technique. None of the junior residents had prior experience with performing the standard cubital tunnel release.



Figure 5. The cadaver arms were dissected by the examiners to evaluate for length and completeness of release and any obvious complications to the MABC or ulnar nerve.

Conclusion

This study demonstrated that surgical residents were able to learn this novel cubital tunnel release technique and immediately perform the procedure in an examination setting with relative ease. All senior residents achieved full release of the cubital tunnel with no complications with the use of the lighted breast retractors. This study also highlighted the importance of simulated clinical assessments to the advancement of a resident's education. Furthermore, all residents were in favor of including this and similar technical skill assessments in their curriculum to ensure they obtain targeted areas of improvement required for them to be well prepared for their practice after completion of their training program.