Perspectives from Surgeons and Patients on What Should be Considered a Critical Portion of Foot and Ankle Procedures

Alexandra F Flaherty, Vasundhara Mathur, Nasser Heyrani[1], Bart Lubberts[2], Gregory Richard Waryasz[2], Daniel Guss, Soheil Ashkani Esfahani[3], Christopher W DiGiovanni[4]
[1]Corona-Temecula Orthopaedic Associates, [2]Massachusetts General Hospital, [3]Department of Orthopaedic Surgery, Massachusetts General Hospital, Harvard Medical School, Massachusetts General Hospital, [4]Mass General/Newton-Wellesley, F&A Ctr

INTRODUCTION: Over the last decade, simultaneous or overlapping procedures in orthopaedic surgery have come under increased media attention and public scrutiny. Central to this discussion has been the definition of what constitutes the “critical portions” of a surgical procedure. Understanding both the patients' and surgeons' perspectives on what should be considered a “critical portion” in a surgery is not only key to effectively moving forward in this ongoing discussion, but it may also provide insight into potential gaps in knowledge and associated opportunities for further education. In this study we aimed to assess which parts of three common foot and ankle surgeries are considered “Critical Portions” from both patients’ and surgeons’ perspectives.

METHODS: In this survey-based study, questionnaires were administered to the patients presenting to the Foot and Ankle clinic as well as electronically circulated among foot and ankle surgeons. The questionnaires addressed the key steps (15-16 per procedure) of three common procedures in foot and ankle surgery: open reduction and internal fixation (ORIF), Achilles tendon repair, and ankle arthroscopy. The technical terms in these steps were rephrased using layman words in the questionnaires directed at patients, to achieve better understanding of the procedures. The respondents in both groups were asked to characterize each step as “Always Critical,” “Often Critical,” “Sometimes Critical,” “Rarely Critical,” or “Never Critical.” Additionally, demographic data questions and a quality control question were included in the questionnaire. In total, the responses of 49 patients and 31 surgeons were collected. Imputation methods were used to fill in missing data points (n=7). “Always Critical” or “Often Critical” responses rate of more than 50% of the respondents was taken as the threshold for classification as a critical portion in this study. “Sometimes Critical” response was considered as an indifferent response. Data collected from patients and surgeons was compared using Mann Whitney U and Kruskal-Wallis tests. A p-value of less than 0.05 was considered statistically significant.

RESULTS: It was observed that Informed Consent, Preoperative Marking, Preoperative Timeout, Soft Tissue Dissection, and Procedure Specific Steps were considered to be critical portions across all three procedures by both patients and surgeons (Figures 1-3). Patients also considered incision and superficial wound closure to be critical steps in all three procedures (Figures 1-3). The implicated consensus between patients and surgeons for Informed Consent, Preoperative Marking, and Preoperative Timeout (*Table 1*) was statistically confirmed. A statistically significant difference was noted in patient and surgeon responses, for several steps (Table 1), including Meeting Members of the Surgical Team, Tourniquet Application, Dissection, and Superficial Wound Closure, implying some degree of variation in the importance attached to these steps by the two groups. Lastly, an analysis of responses across the three procedures demonstrated that both patients’ and surgeons’ perspectives on critical portions were independent of the surgical procedure, except for deep and superficial wound closure steps for which surgeons’ opinions varied depending on the procedure.

DISCUSSION AND CONCLUSION: The responses gathered in this study provide insight into the importance patients and surgeons place on each portion of three common foot and ankle procedures, which may aid in the on-going discussion regarding the definition of a “critical portion” of a surgical procedure. Patients and surgeons agreed that Informed Consent, Preoperative Marking, Preoperative Timeout, Soft Tissue Dissection and Procedure specific steps should be considered critical steps, as indicated by a greater than 50% response rate of “Always” or “Often” critical. Among the steps in which a significant difference was found between patient and surgeon responses, all steps that were considered critical by surgeons were also considered critical by patients. On the other hand, patients considered superficial wound closure in all three procedures and skin incision in ORIF critical, while surgeons did not consider these steps critical. These results highlight the need for continued patient education, with a focus on the details of and skills needed for each step. If a consensus can be reached on what should be considered a critical portion, surgeons can refrain from attending non-critical portions of a surgery and direct their time and energy to potentially focus on another operation in which their presence is critical. This prioritization can lower the risk of clinical errors as well as prevent physician burnout.

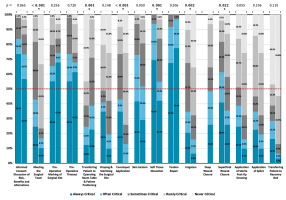

Figure 2: Achilles Repair – comparison of patient and surgeon responses broken down by step. The patient responses are demonstrated by the left-sided columns, and the surgeon responses are indicated by the right-sided columns. The blue shading represents the "Always Critical" and "Often Critical" responses. The red dashed line corresponds with the 50% "Always/Often Critical" threshold used to characterize critical portions. The p-values along the top of the graph indicate the statistical difference between patient and surgeon responses, the bolded & unerlined steps demonstrated a significant difference between patient and surgeon responses.

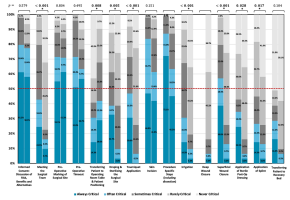

Figure 3: Achilles Repair – comparison of patient and surgeon responses broken down by step. The patient responses are demonstrated by the left-sided columns, and the surgeon responses are indicated by the right-sided columns. The blue shading represents the "Always Critical" and "Often Critical" responses. The red dashed line corresponds with the 50% "Always/Often Critical" threshold used to characterize critical portions. The p-values along the top of the graph indicate the statistical difference between patient and surgeon responses, the bolded and unerlined steps demonstrated a significant difference between patient and surgeon responses.

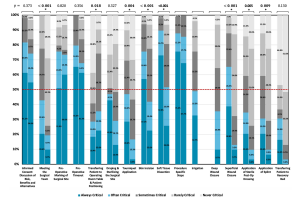

Figure 1 : ORIF – comparison of patient and surgeon responses broken down by step. The patient responses are demonstrated by the left-sided columns, and the surgeon responses are indicated by the right-sided columns. The blue shading represents the "Always Critical" and "Often Critical" responses. The red dashed line corresponds with the 50% "Always/Often Critical" threshold used to characterize critical portions. The p-values along the top of the graph indicate the statistical difference between patient and surgeon responses, the bolded and unerlined steps demonstrated a significant difference between patient and surgeon responses.

Table 1: Mann – Whitney U test for Comparing surgeons' and patients' responses for each step in each of the three procedures: Open Reduction Internal Fixation (ORIF), Achilles Repair, and Arthroscopy. Steps found to be significantly different (p value <0.05) between the patient and surgeon groups are in bold.

ORIF	
	p-value
Informed Consent	0.373
Meeting the Surgical Team	**<0.001**
Pre-Operative Marking	0.828
Pre-Operative Timeout	0.356
Patient Positioning	**0.018**
Sterilization & cropping	0.327
Tourniquet Application	**0.004**
Incision	**<0.001**
Dissection	**<0.001**
Fracture Reduction	0.585
Insertion of Hardware	0.118
Superficial Wound Closure	**<0.001**
Application of Post-Op Dressing	**0.004**
Splint Application	**0.009**
Transferring Patient to Recovery Bed	0.130

Achilles Repair	
	p-value
Informed Consent	0.069
Meeting the Surgical Team	**<0.001**
Pre-Operative Marking	0.356
Pre-Operative Timeout	0.720
Patient Positioning	**0.001**
Sterilization & cropping	0.190
Tourniquet Application	**<0.001**
Incision	0.950
Dissection	**0.001**
Tendon Repair	0.306
Irrigation	**0.005**
Superficial Wound Closure	**0.022**
Application of Post-Op Dressing	0.010
Splint Application	0.356
Transferring Patient to Recovery Bed	0.110

Arthroscopy	
	p-value
Informed Consent	0.575
Meeting the Surgical Team	**<0.001**
Pre-Operative Marking	0.864
Pre-Operative Timeout	0.685
Patient Positioning	**0.008**
sterilization & cropping	**0.005**
Tourniquet Application	**<0.001**
Incision	0.193
Dissection & Placement of Cannvas	**<0.001**
Assessment of Intra-articular Space	**<0.001**
Irrigation	**<0.001**
Application of Post-Op Dressing	**0.039**
Splint Application	**0.037**
Transferring Patient to Recovery Bed	0.104