Validity of a Revision Surgery Classification System for Ankle Arthritis Surgery

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Introduction/Purpose: Reoperations may be a better way of tracking adverse outcomes than complications. Repeat surgery causes cost to the system, and often indicate failure of the primary procedure resulting in the patient not achieving the expected improvement in pain and function.
Understanding the cause of repeat surgery at the primary site may result in design improvements to implants or improvements to fusion techniques resulting in better outcomes in the future. Repeat operations around the primary site may also be relevant to the primary surgery.
The COFAS group have designed a reoperation classification system. The purpose of this study was to outline the inter and intra observer reliability of this classification scheme.

Methods: To verify the inter- and intra-observer reliability of this new coding system, six fellow ship trained practicing foot and ankle Orthopaedic surgeons were asked to classify 61 repeat surgeries. The six surgeons read the operation reports in random order, and reread the reports 2 weeks later in a different order. Reliability was determined using regression analysis and intraclass correlation coefficients (ICC) were calculated and proportions of agreement. The agreement between pairs of readings (915 for inter observer for the first and second read; 61 readings with 15 comparisons) was determined by seeing how often each observer agreed. This was repeated for the 366 ratings for intra observer readings (61 times 6).

Results: The inter-observer reliability test on the first read had a mean intra-class correlation coefficient (ICC) of 0.89, range 0.80 to 0.96. For 61 cases, 45 (74%) observations that were given the same code across all six observers for the first read.
The inter-observer reliability test on the second read had a mean ICC of 0.94, range .90 to to 1.0. There were 43 (72%) observations that were the same across all six observers.
Of all pairs (915 in total) there was agreement in 804 pairs for the first reading (88%). For the second reading there was agreement in 801 pairs (86%).
The observers agreed with themselves in the intra-observer observation 324 times out of 366 paired readings (89% agreement of pairs).

Conclusion: The COFAS classification of reoperations for end stage ankle arthritis was reliable. This scheme potentially could be applied to other areas of Orthopaedic surgery and should replace the Claiden Dindo modifications that do not accurately reflect Orthopaedic outcomes. As complications are hard to define and lack consistent terminology (Mercer) reoperations and resource utilization (extra clinic visits, extra days in hospital and extra hours of surgery may be more reliable measures of the negative effects of surgery.

Interclass correlation coefficients for inter- and intra-observer reliability.

Table a: First read:

	A1	*B1*	*C1*	*D1*	*E1*	*F1*
A1						
B1	0.84					
C1	0.87	0.96				
D1	0.87	0.90	0.95			
E1	0.87	0.95	0.95	0.88		
F1	0.81	0.88	0.92	0.92	0.80	

Average: 0.89

Table b: Second read

	A2	*B2*	*C2*	*D2*	*E2*	*F2*
A2						
B2	0.92					
C2	0.96	0.93				
D2	0.95	0.94	0.97			
E2	0.95	0.95	0.97	1.00		
F2	0.93	0.92	0.92	0.90	0.91	

Average: 0.94

Table c: Intra observer reliability correlation matrix, first read to second read.

A1 to A2	*B1 to B2*	*C1 to C2*	*D1 to D2*	*E1 to E2*	*F1 to F2*	*Mean*
0.86	0.89	0.98	0.97	0.89	0.91	0.92

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