Complications of Hardware Removal

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Purpose: While hardware removal (HR) may improve patient symptoms, any surgery carries risks of unexpected outcomes. Despite being one of the most commonly performed orthopaedic procedures, scant attention has been given to the prevalence and complication profile from HR in orthopaedic surgery. The use of the American Board of Orthopaedic Surgery (ABOS) de-identified database of Part II surgical cases has been employed for numerous orthopaedic interventions to understand trends and complications of such interventions.

Methods: The ABOS de-identified database of Part II surgical case lists from 2013-2019 was queried for Current Procedural Terminology (CPT) code 20680 Removal of implant; deep], and other implant removal codes (20670, 22850, 22852, 22855, 26320). Only HR cases that were performed without any other concurrent procedure were included and examined for associated complications. For the generic complications that required further definition, questionable or ambiguous complications were reviewed by two authors for relevance. The complications were categorized and analyzed by region of the body.

Results: In the years analyzed, isolated hardware removal was performed in 13,089 of the 609,150 (2.1%) of cases, making it the most common reported CPT code for Part II examinees. A complication was reported to have occurred in 1256 of 13,089 (9.6%) of these procedures, including 1151 with surgical complications (8.8%) and 196 (1.5%) with medical/anesthetic complications. The most commonly reported complications were wound-healing delay/failure (2.1%), infection (1.6%), and uncontrolled postoperative pain (1.5%) but other serious events were reported: unexpected reoperations (2.5%), unexpected readmissions (1.6%), continuing pain (1.2%), nerve injury (0.6%), bone fracture (0.5%), and life-threatening complications (intraoperative or immediate postoperative arrhythmia, cerebral vascular accident, congestive heart failure, myocardial infarction, patient expired, pulmonary embolism, respiratory failure, etc) (0.4%). Complication by anatomic region did not significantly differ, except for complications of pelvis/hip (14.8%) (P<0.001) compared to the hand/fingers (8.7%) and femur/knee (8.9%) regions.

Conclusion: Hardware removal is one of the most commonly performed orthopaedic procedures and was associated with a 9.6% overall complication rate in an early U.S. orthopaedic surgeon's practice. Although specific complications like infection, refractures, and nerve damage were reported to each have relatively low rates of occurrence, and associated life-threatening complications are rare, surgeons and patients should be aware that HR carries risk that should be considered when considering intervention.