

POSTER 64

Financial Analysis of the Two-Stage Osseointegrated Protheses for the Rehabilitation of Amputees (OPRA) Implant System: A Hospital Perspective

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Background: Extremity amputation is occasionally a necessary treatment option for patients suffering from aggressive bone or soft tissue malignancy, severe vascular injuries, infections, or trauma. Traditional prostheses greatly improve a patient's functional capacity after an amputation, but have many drawbacks and side-effects, including pain, imperfect fit, and skin breakdown. Other patients with short residual limbs or bilateral above knee amputations find it impossible to socket in a traditional prosthesis. The Osseointegrated Protheses for the Rehabilitation of Amputees (OPRA™) Implant System (Integrum, Mölndal, Sweden) alleviates some of these issues through direct implant fixation into the bone of the amputated extremity. Many prior studies, mainly performed in Sweden, have shown clinical success of this OPRA system. The initial prospective study performed in Sweden showed that 18 patients treated with OPRA showed statistically significant improvements in healthcare related quality of life, prosthetic use, prosthetic mobility, and subjective improvements in amputation situation after 2 years of follow-up. Other studies have similarly shown overall improvements in patient quality of life after implantation of the OPRA system.

Questions/Purposes: While the benefit of the OPRA procedures has been proven clinically, there has not yet been a financial analysis of the procedures in an American healthcare system. The ultimate purpose of this research is to determine the financial viability of the OPRA procedures from a hospital perspective. We will analyze hospital costs and fees associated with the OPRA procedures alongside insurance reimbursements to determine the overall operating margins of the OPRA system. This research will help determine the financial viability of the OPRA procedures for future patients who may benefit from it.

Patients and Methods: Since November 2019, nine patients (twelve limbs) have undergone the stage one OPRA procedure at our institution, while seven of these patients (ten limbs) have completed both stages of the implantation. Eleven procedures were performed following transfemoral amputations, while one procedure was performed following a transhumeral amputation under a compassionate use waiver from the FDA. These patients ranged from 28-60 years of age at the time of surgery, with eight males and one female. Six of the nine patients underwent the OPRA procedures following amputations for trauma, while the other three were performed following arterial aneurysms leading to amputation. The financial analysis includes total costs, total charges, and overall reimbursements per procedure. After IRB approval of the study, all information was obtained via retrospective review, and all charges and costs include both hospital and professional fees.

Results: For the seven patients who have completed both stages of OPRA implantation, procedures were approved by commercial insurance (3), Worker's Compensation (2), Medicare (1), and Medicaid (1). Overall total hospital charges for these patients ranged from \$202,967-\$410,296 (median = \$230,866). Overall insurance reimbursements ranged from \$32,137-\$365,624 (median = \$119,468), though one patient was excluded as this case is still pending reimbursement and the value will be updated in the future. Excluding this patient, the reimbursement percentage based on the total charges ranges from 14.7%-89.1% (median = 52.3%). Total hospital and professional costs of the procedures ranged from \$39,061-\$146,818 (median = \$68,170). Overall operating margins (excluding the one patient awaiting full reimbursement) ranged from -\$46,236-\$218,806 (median = \$50,752 of profit). Ultimately, four out of the seven OPRA implantations yielded a net profit for the hospital system. For the two patients who have only undergone stage one of implantation, the reimbursement percentages were 38.5% and 96.0% and the net operating margins were \$6,462 and \$145,055, respectively.

Conclusions: The OPRA implant system provides an excellent clinical alternative to traditional prostheses following extremity amputation. This financial analysis shows that in addition to the clinical benefit for patients, the OPRA procedures are financially viable procedures from a hospital perspective, with an overall median net profit of \$50,752 after completion of both stage 1 and stage 2 of the procedure. This profit is in addition to other revenue sources, such as those from therapy, radiology, and follow-up visits after discharge from the patient's hospital stay. Ultimately, both the clinical and financial benefits of the OPRA system make it an attractive option for management of future extremity amputations.