Intra-operative Waste in Spine Surgery: Incidence, Cost, and Effectiveness of an Educational Program
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Introduction: Each year, over 600 000 surgical interventions are performed on the spine in the United States. Spine procedures are known for their associated high cost, particularly in cases where instrumentation is employed. Intra-operative waste -defined by previous authors as products that were prepared but not used during the surgery, and could not be reused for a different patient- can contribute to the high cost of spine surgery. Prior studies have demonstrated that surgical implant waste is a factor influencing cost in arthroplasty and orthopaedic trauma. However, the role of intra-operative waste has not yet been studied in the context of spine surgery. This study aims to quantify the incidence of intra-operative waste in spine surgery, and to examine the efficiency of an educational program directed at surgeons in inducing a decrease in the intra-operative waste.

Methods: Data was collected during a 25-month period (October 2007 to November 2009) from one academic center. The total number of spine procedures, and the incidence of intra-operative waste were recorded prospectively. Other variable recorded included the type of product wasted, cost associated with the product or implant wasted, and reason for the waste. After an initial observation period of 15 months, an educational program was put in place. Surgeons were made aware of the definition of intra-operative waste, and data on total cost incurred was presented. Data was collected for an additional 10 months after the intervention. Statistical analysis was performed with STATA (v11.0), using X², t-tests, and regression analysis as deemed appropriate. A p-value of less than 0.05 was considered significant.

Results: Intra-operative waste occurred in 20.2% of the procedures prior to the educational program and in 10.3% of the procedures after the implementation of the program (p< 0.0001). Monthly costs associated with surgical waste were, on average 17680.29$ prior to the awareness intervention, and 5876.87$ afterwards (p=0.0006). Further analysis of our data revealed that implant waste was associated with a higher cost than other types of waste (662.5$/item, p< 0.001). In cases were the reason of wastage was the surgeon’s change of mind, a higher cost per item wasted was observed (532.9$/item, p< 0.001). Our educational program allowed us to decrease the number of implants wasted (OR 0.434 p< 0.001), and the incidence of surgeons’ change of mind (OR 0.41, p< 0.001).

Discussion: To our knowledge, this is the first study looking at the incidence of intra-operative waste in spine surgery, and evaluating the effectiveness of an awareness program. According to our results, the incidence of surgical waste related to spine surgery is considerably higher than that published in the trauma and arthroplasty literature. Prior to the educational intervention, the annualized cost related to surgical waste was 212 000$ at our institution. Extrapolation of our data to the national level leads to an annual estimate of 127 200 000 $ attributable to intra-operative waste. A program that made surgeons aware of costs related to surgical waste allowed us to reduce that value by 66%. This study demonstrates that surgical waste is an important cost in spine surgery, and that surgeon awareness may help contribute to decrease the cost burden.