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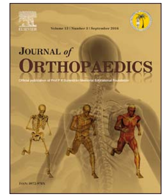

Periprosthetic hip fractures: A review of the economic burden based on length of stay

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ABSTRACT

Introduction: With the increasing rates of total hip replacements being performed worldwide, there is an increasing incidence of periprosthetic fractures. As our patients' demographics change to include older patients with multiple medical co-morbidities, there is a concurrent increase in morbidity and mortality rates. This leads to longer hospital stays and increasing hospital costs. In the current economic climate, the cost of treating periprosthetic fractures must be addressed and appropriate resource and funding allocation for future provision of services should be planned.

Materials and methods: All periprosthetic hip fractures that were admitted to a single trauma unit over a three-year period were reviewed. Independent chart review, haematological and radiological review was undertaken. All patients with a periprosthetic fracture associated with a total hip arthroplasty or hemiarthroplasty were included. Follow up data including complications were collated. Data from the hospital inpatient database and finance department was utilized for cost analysis. All statistical analysis was preformed using Minitab version 17.

Results: 48 patients were identified who met the inclusion criteria for review. The majority of participants were female with a mean age of 73.5 years. The mean time to fracture was 4.5 years (9 months–18.5 years). Periprosthetic fracture was associated with total hip arthroplasty in 24 cases and a Vancouver B2 classification was most common at n = 20. The majority of patients had revision arthroplasty, with a mean length of stay of 24 days for the whole cohort (9–42). Vancouver B3 fractures had the longest inpatient stay at a mean of 26 days. The mean cost of for a full revision of stem with additional plate and cable fixation was over €27000 compared to €14,600 for ORIF and cable fixation based on length of hospital stay.

Conclusion: The prolonged length of stay associated with Vancouver B2 and B3 fractures leads to increased costs to the healthcare service. Accurately calculating the costs of total treatment for periprosthetic fractures is difficult due to a lack of transparency around implant and staffing costs. However, as we can expect increasing incidence of periprosthetic fractures presenting in the coming years it is paramount that we make financial provisions within healthcare budgets to ensure we can treat these patients appropriately.

1. Introduction

The national joint registries worldwide put the incidence of periprosthetic hip fractures at 25.3 per 1000 total hip replacements preformed.[1] The incidence of periprosthetic hip fractures has been predicted to be up to 21% by 2020 in a paper by Frenzel et al.[2] Not only are the numbers of people undergoing primary hip arthroplasty increasing, but the patient demographic is also changed. Now increasing body mass index, patient age and post-operative activity demands are all different. With these changes, patients and clinicians all have high expectations for clinical outcomes. However, as BMI increases and younger patients have higher activity levels, periprosthetic fractures can be expected at all our institutions.[3] Due to the complex reconstruction and revision arthroplasty procedures needed to deal with periprosthetic fractures, these patients can often have lengthy and ultimately costly stays in hospital. No literature from the Republic of Ireland to date has looked at the costs of periprosthetic hip fractures in our current economic climate.

2. Patients and methods

In order to assess the economic impact of periprosthetic hip fractures a review of the current literature was undertaken. Analysis of the cost to the health service in one major trauma unit over a three-year period for all patients treated for periprosthetic fractures was also undertaken. As the Vancouver classification is widely used for

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Implant	Number of patients
Primary total hip arthroplasty	24
Revision total hip arthroplasty	2
Hemiarthroplasty	22

Fig. 1. Table: Implant associated with periprosthetic fracture.

Vancouver Classification	Number of patients
A	0
B1	9
B2	20
B3	13
C	6

Fig. 2. Table: Vancouver Classification.

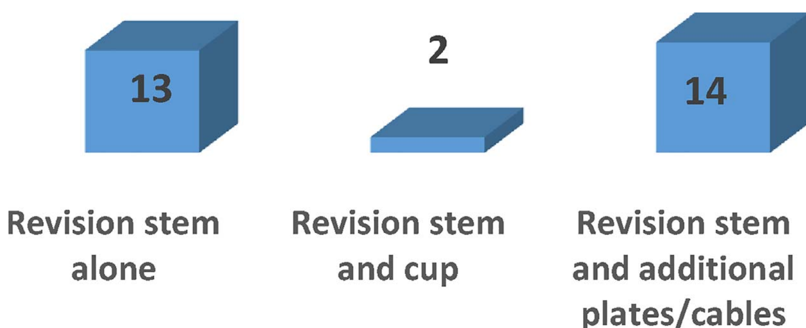

Fig. 3. Revision operative intervention.

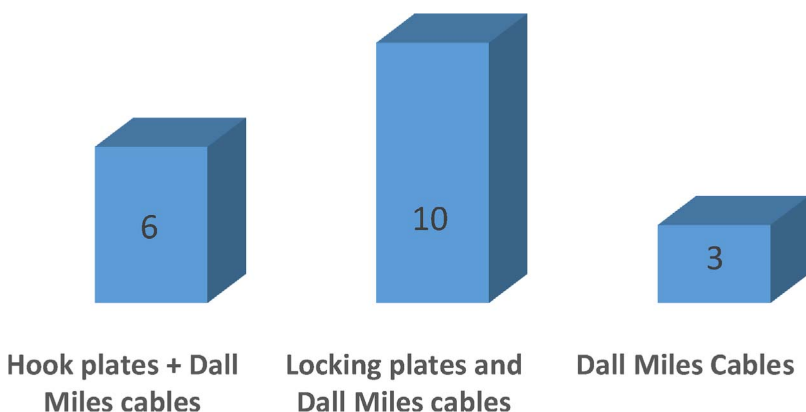

Fig. 4. ORIF operative constructs undertaken.

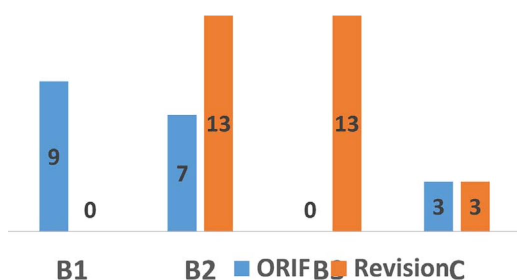

Fig. 5. Operative intervention based on Vancouver classification.

stratification of periprosthetic fractures, we used this as method to assess the difference in hospital stay between groups.

Between 2013 and 2015, all patients who presented with a periprosthetic fracture surrounding a hip prosthesis were reviewed. All patients treated operatively were included in the analysis. A retrospective review of all patients who underwent either open reduction internal fixation or revision hip arthroplasty were included for analysis. Total hip arthroplasty and hemiarthroplasty cases were collated. The hospital notes were reviewed and all data collected using a standardised proforma to ensure accurate collection of information for analysis. Collection of all data including all haematological and radiological investigations. The hospital length of stay was collated to facilitate analysing the cost. All patients were classified on presentation as per the Vancouver classification of periprosthetic hip fractures. If required the Vancouver classification was modified based on intra-operative findings.

3. Results

Over a two-year period, 48 patients were identified who had periprosthetic fractures needing operative intervention. The median age of the cohort was 73.5 years (53–88) and predominantly female, n = 30.

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