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Management of Periprosthetic Femoral Fractures: About 12 Cases

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Original Research Article

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Abstract: The annual incidence of periprosthetic femoral fractures is increasing exponentially; it varies between 0 and 1.2%. The severity of these fractures is underlined by a high mortality rate. Our work is based on a retrospective study of 12 patients treated in the department of orthopedic surgery and traumatology at Ibn Sina Hospital in Rabat over a period of 6 years. The fracture occurred in 7 cases on a total hip prosthesis and on intermediate prosthesis in 5 cases. The prosthesis was cemented in 66.6% of cases and not cemented in 33.3%. According to the Vancouver classification, fractures were divided into 3 cases of type B1 (33.3%), 4 cases of type B2 (33.3%) and 4 cases of type C (33.3%). The treatment was surgical in all our patients; 75% received osteosynthesis and 25% of our patients benefited from a change of the femoral stem which was replaced by a long stem, locked in 1 case and cemented in 2 cases.

Keywords: Fracture, Femoral, Periprothetic

INTRODUCTION

The incidence of peri-prosthetic hip fractures is increasing exponentially due to the increased number of hip prosthesis implantation and aging of the population [1-3]. Prevalence is difficult to assess. Femur fractures occurring on a hip prosthesis pose many therapeutic problems [2, 3]. The analysis of the surgical technique, the perioperative evolution and the bone consolidation made it possible to evaluate the fracture fate at the 6-month threshold.

METHODS

This is a retrospective study of 12 patients treated between January 2010 and December 2015 in the orthopedic and trauma surgery department at Ibn Sina Hospital in Rabat and reviewed with a mean follow-up of 12 months. Femur fractures occurred in a total or intermediate hip prosthesis. We excluded from our study all intraoperative fractures, fractures that occurred during the first three months after prosthesis placement and pathological fractures on tumor or infection. The fracture was analyzed using the Vancouver classification.

RESULTS

Of all our patients, eight were female (66.6%) and four male (33.3%). The average age is 68, with age extremes of 66 and 81 years. 7 patients walked without a cane, 3 patients used two canes, 1 patient moved with a walker and 1 patient was bedridden. The affected side was right in 80% of the cases. 10 patients presented the periprosthetic fracture after a simple fall from their height, and 2 patients fell from the stairs. The delay between prosthesis placement and periprosthetic fracture was between 4 years and 12 years. The fracture occurred in 7 cases on a total hip prosthesis (58.3%) and in 5 cases on intermediate prosthesis (41.3%). The prosthesis was cemented in 66.6% of cases and not cemented in the rest.

On clinical examination, none of our patients presented with cutaneous opening, or vascular or nerve lesion. According to the Vancouver classification, fractures were divided into 3 cases of type B1 (33.3%), 4 cases of type B2 (33.3%) and 4 cases of type C (33.3%).

The treatment was surgical in all our patients, 75% of our patients received an osteosynthesis, made by plate coupled to a strapping in 44.4% of the cases, by a strapping alone in 33.3% of the cases and by a plate screwed in 22.2%. A quarter of our patients benefited from a change in the femoral stem which was replaced by a long rod, locked in 1 case and cemented in 2 cases.

The average time to surgery after the trauma was 5 days and the average length of stay was 12 days. The overall mortality rate at 6 months was 8.33% (one case only). The morbidity rate at 6 months was 16% with two immediate postoperative complications: a case of superficial infection of the wall (8.33%) and a case of phlebitis of the leg (8.33%) treated medically. The consolidation was obtained in all cases and bone fixation was good in 83.33% (10 cases) without evidence of obvious loosening.

DISCUSSION

The prevalence of periprosthetic fractures is 0.1 to 1% for cemented primary prostheses and 3 to 5.4% for uncemented prostheses. It amounts to 6% and 17% respectively in cemented and uncemented revision surgery. The annual incidence varies from 0 to 1.2%. An uncemented prosthesis is 5 times more likely to have a periprosthetic fracture than a cemented prosthesis after 10 years of follow-up in a person over 75 years of age [2,4].

The severity of periprosthetic fractures is underlined by a high mortality rate at 6 months. No series of the literature specifically analyzes the mortality and morbidity rate, the various series published, always erratic, essentially focusing on describing the results of the different surgical techniques.

The therapeutic choice in front of a fracture on a hip prosthesis must remain realistic and is based on 3 main parameters: the general state of the patient and his associated defects, the evaluation of the fracture prosthesis assembly, the surgeon's experience in prosthetic revision and the material it has [3,5,6]. Fractures of type A or C do not seem to pose a problem of therapeutic indication most often pertaining to orthopedic treatment and osteosynthesis respectively, except in case of obvious loosening. Type B fractures are the most difficult to choose between osteosynthesis and prosthesis changes. For B3 fractures, where the fixation fails, it seems logical to change the prosthesis. For types B2 we offer osteosynthesis to patients with low functional demands and / or in very poor general condition and prosthetic changes for others. With regard to B1 fractures, osteosynthesis seems to be the rule [6-8].

Competing interests

The authors declare no competing interest.

Authors' contributions

All authors have read and agreed to the final version of this manuscript and have equally contributed to its content and to the management of the manuscript.

CONCLUSION

With the increase in the number of hip replacements, these once rare fractures are becoming more common. They pose the problem of their management because of age and poor bone quality. In general, treatment is urgent if it is associated with neurovascular disorders, open fracture, severe soft tissue lesions or compartment syndrome. The treatment is intended for early in fragile patients, polymorphic, but should not be rushed without having a precise planning and equipment available, anticipating the worst situation. Osteosynthesis must be reliable and meet the criteria of conventional mechanics.

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