



Outcome of Girdlestone's resection arthroplasty following complications of proximal femoral fractures

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Twenty two patients who underwent a Girdlestone resection arthroplasty of the hip (*pseudarthrosis coxae*) following failed operative treatment for hip trauma from 1993 to 2002 were retrospectively reviewed. The indications included failed osteosynthesis of fractures of the neck of the femur (n = 8), septic hemiarthroplasty (n = 9), aseptic loosening of hemiarthroplasty (n = 3) and recurrent dislocation of a hemiarthroplasty (n = 2). The mortality was 68.2% (15 patients, mean age : 78.8 years, 80% females) with a mean time interval between operation and death of 25.6 months. All the seven surviving Girdlestone patients had failed hemiarthroplasties previously. One of these had subsequently undergone re-implantation of a femoral prosthesis, and was excluded from the study. There were four females and two males. The age ranged from 62 to 94 years with a mean age of 79.6 years. There were 4 right-sided and 2 left-sided operations. The patients were followed-up for a mean 37.1 months (range : 6 months to 8 years). Pain relief was achieved in 100% patients with none to mild pain. All the patients had infection control. Four patients needed a frame support for walking, while the remaining two were chairbound. Overall 83.3% patients expressed their satisfaction with the Girdlestone procedure. The Girdlestone operation appears as a viable solution to achieve pain relief and to control infection at the cost of limited mobility in this specific subgroup of patients with failed operative treatment for hip trauma.

Keywords : pseudarthrosis coxae ; Girdlestone resection arthroplasty ; proximal femoral fractures ; hemiarthroplasty.

INTRODUCTION

Revision total hip arthroplasty has revolutionised the treatment of patients with failed operative treatment for hip trauma. However, medically suboptimal and functionally compromised patients, who have a high anaesthetic and operative risk, may not be suited for any further major interventions. In such cases, the Girdlestone resection arthroplasty (*pseudarthrosis coxae*) is often considered as an acceptable option (1-15).

Girdlestone's resection arthroplasty of the hip is proved to be an effective salvage procedure, especially in terms of control of pain and control of infection in failed hip arthroplasties. The indications for Girdlestone arthroplasties following failed operative treatment for hip trauma are not well described in the literature. The aim of this study was to assess the outcome after Girdlestone resection arthroplasty performed for complications of operative treatment of proximal femoral fractures.

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Table I. — Mortality patterns in Girdlestone hips following failed operated hip fractures

No.	Age	Sex	Side	Indication for Girdlestone procedure	Operation-death interval (in months)
1	76	F	L	Failed DHS	13
2	83	F	R	Sepsis Hemi.	51
3	88	F	L	Failed DHS	26
4	82	F	L	Failed DHS	4
5	82	M	R	Failed Screws	3
6	54	M	L	Failed DHS	2
7	88	F	L	Failed DHS	7
8	82	F	R	Aseptic Hemi.	38
9	91	F	R	Failed DHS	38
10	89	F	R	Sepsis Hemi.	1
11	61	F	L	Sepsis Hemi.	46
12	89	F	L	Failed DHS	73
13	79	F	R	Sepsis Hemi.	0.5
14	75	M	R	Aseptic Hemi. with Recurrent Dislocation	51
15	83	F	L	Aseptic Hemi.	31

NB : Hemi.-Hemiarthroplasty, R-Right, L-Left, F-Female, M-Male, THR-Total Hip Replacement, DHS-Dynamic Hip Screw.

MATERIALS AND METHODS

From 1993 to 2002, 22 resection arthroplasties of the hip were performed at two hospitals for failed operative treatment for fractures of the hip. The indications were failed osteosynthesis of fracture of the neck of the femur in 8 cases, septic hemiarthroplasty in 9 cases, aseptic loosening of a hemiarthroplasty in 3 cases and recurrent dislocation of a hemiarthroplasty in 2 cases.

The case notes and charts of 22 Girdlestone resection arthroplasties were retrospectively reviewed. The data documented comprised the patient's personal details, age at operation, sex distribution, laterality of hip, indication of surgery, total follow-up in months for surviving patients and time interval between the date of operation and the date of death to detect the total survival period following Girdlestone operation.

The functional outcome was assessed by telephone questionnaire performed by a single assessor. Subjective assessment was recorded in terms of pain, leg length discrepancy, use of walking aids, walking ability, functional activities, infection control and overall satisfaction status.

RESULTS

Fifteen patients (septic hemiarthroplasty-4, aseptic hemiarthroplasty-2, recurrent dislocation of hemiarthroplasty-1, failed cannulated cancellous screw fixation-1, failed Dynamic Hip Screw fixa-

tion-7) died following the Girdlestone procedure for failed fractured hips (table I). The mean age was 78.8 years (table II) with an 80% female preponderance in this group of deceased patients. The mortality following failed operated hip trauma was 68.2% with a mean time interval of 25.6 months between operation and death (range : 2 weeks to 73 months) (table III).

All the seven surviving patients had their Girdlestone operation following failed hemiarthroplasty. There were five cases with sepsis following hemiarthroplasty, one case of sepsis associated with a recurrent dislocation of a hemiarthroplasty and a recurrent dislocation following hemiarthroplasty in one case. One Girdlestone patient had subsequently undergone re-implantation and was excluded from the study. There were four females and two males. The age ranged from 62 to 94 years with a mean age of 79.6 years. There were 4 right-sided and 2 left-sided operations. The patients were followed-up for a mean 37.1 months (range : 6 months to 8 years). Pain relief was achieved in 100% patients with none to mild pain in the hip. All the patients had infection control. Four cases needed a frame support for walking, while the remaining two were chairbound. Overall 83.3% patients expressed their satisfaction with the Girdlestone procedure. One patient expressed the satisfaction

Table II. — Mortality with respect to age at operation

Age group	Number of patients
51-55	1
56-60	0
61-65	1
66-70	0
71-75	1
76-80	2
81-85	5
86-90	4
91-95	1

Table III. — Mortality in relation to the postoperative period

Postoperative duration	Number of patients
<1 month	1
1-3 months	3
3-6 months	1
6-12 months	1
1-2 years	1
2-3 years	2
3-4 years	3
4-5 years	2
5-6 years	0
6-7 years	1

Table IV. — Details of functional outcome in patients following Girdlestone arthroplasty after failed operation for hip trauma

No	Age	Sex	Side	Indication for Girdlestone procedure	Pain	Infection	Walking aids	Satisfaction	Follow-up (months)
1	79	F	R	Sepsis Hemi.	None	Controlled	Zimmer frame	Satisfied	53
2	88	F	L	Sepsis Hemi.	Mild	Controlled	Zimmer frame	Satisfied	96
3	94	F	R	Sepsis Hemi.	Mild	Controlled	Chair bound	Satisfied	6
4	81	F	L	Recurrent dislocation Hemi.	Slight	NA	Chair bound	Neither satisfied, nor dissatisfied	9
5	74	M	R	Sepsis with recurrent dislocation Hemi.	None	Controlled	Zimmer frame	Satisfied	14
6	62	M	R	Sepsis Hemi.	None	Controlled	Zimmer frame	Satisfied	36

NB : Hemi.-Hemiarthroplasty, R-Right, L-Left, F-Female, M-Male, NA-Not Applicable.

status as neither satisfied, nor dissatisfied (table IV).

DISCUSSION

With the recent advances in orthopaedic surgery, the indications for Girdlestone resection arthroplasty after failed operated fractures of the hip are very limited. This study found that the Girdlestone resection arthroplasty was a viable option to salvage irreversibly failed operated hip fractures in medically suboptimal patients. The associated high mortality was attributed to advanced age and poor general health status in such a highly selected group of patients.

The mortality following failed operated hip trauma was 68.2%. There is a reported mortality between 7% and 62% following Girdlestone operation for infected total hip replacements (6). The difference between previously published studies and the current series can be explained on the basis of associated co-morbidities, poor general health, higher age and principally a different indication. The possible explanation could be poor coping with trauma related factors. As can be inferred from table III, eleven out of fifteen deaths were unrelated to the operative procedure.

In a previously published study assessing the outcome of salvage resection arthroplasty in 14 cases following failure of hip trauma operations,

the authors found that the functional condition did not deteriorate and the long term outcome remained favourable and comparable to their counterpart Austin Moore hemiarthroplasty patients (15).

The functional outcome in previous studies on Girdlestone's resection arthroplasty is illustrated in table IV. Previous studies assessed the long-term outcome mainly in infected total hip replacements, and to some extent in aseptic loosened hip replacements (1, 2, 6-8, 10-12). The results are contradictory. The reported results of Girdlestone's arthroplasty are not uniform. Satisfactory results have been reported by Campbell *et al* (5), Mallory (10), Ahlgren *et al* (1), Grauer *et al* (9), Bolher and Salzer (3) and Castellanos *et al* (6), while poor outcome was noticed in Girdlestone hips by Clegg (7), Petty and Goldsmith (14), Bittar and Petty (2), McElwaine and Colville (12) and Esenwein *et al* (8).

The mean age in our study was 79.6 years. Old patients have limited functional demands and a lower degree of expectations to yield fair to good outcome. Adequate pain relief had been documented after resection arthroplasty (7, 12). We achieved overall 100% pain relief, which is comparable to Ahlgren *et al* (1), Bourne *et al* (4), Clegg (7) and Mallory (10). Clegg (7) advocated complete removal of all the cement remains in order to achieve eradication of infection. We agree with the views of Ahlgren *et al* (1), Bourne *et al* (4) and Petty & Goldsmith (14) that small amounts of retained cement do not seem to influence wound healing after resection arthroplasty. Castellanos *et al* (6) found no correlation between the type of organisms and the persistence of infection. We achieved 100% infection control in the surviving patients.

Of the six surviving Girdlestone patients, four needed Zimmer frame support for in-house mobilisation, while the remaining two were chairbound. The use of walking aids should not be considered as a negative assessment. The limb shortening is invariable after Girdlestone procedure and associated gluteus medius insufficiency magnifies the situation for need of assisted walking (9, 15). None of the surviving patients were able to walk even short distances in the home without an ambulatory support.

Overall 83.3% patients expressed their satisfaction in their Girdlestone procedure. The overall

satisfaction is a very sensitive indicator of long-term functional outcome. The subjective contentment indicates patient's adaptation to the altered hip state. Detailed information can influence the level of expectation and thereby the subjective result (13).

There is general agreement that these patients do relatively better than those medically suboptimal patients with deep infections left alone untreated. Due to the very limited number of surviving Girdlestone patients, a prospective randomised controlled study is extremely difficult to carry out. The number in this series is small in spite of aggregating data from two hospitals spanning 13 years. Future studies with larger number of patients utilising results from multiple centres may reveal more meaningful results.

CONCLUSION

The Girdlestone procedure appeared in this study to effectively achieve infection control and pain relief following failure of operative treatment for hip fractures. There was a high mortality associated with such a group of patients. The satisfaction rate was high despite a poor functional outcome in the surviving group of patients, probably because of their limited functional demands.

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