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The Mennen plate: unsuitable for elderly femoral peri-prosthetic fractures

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Abstract

The Mennen plate has been advocated for femoral shaft and femoral peri-prosthetic fractures. We utilised this fixation system in five patients with peri-prosthetic femoral shaft fractures. The operative technique was that described by the CMW laboratories. The postoperative regimen deviated from that recommended, i.e. prolonged bed-rest, since the patients were elderly and complicated by chest problems and pressure sores.

Once the surgical wounds had healed, at an average of 11 days (range 10–14 days), one patient achieved non-weight-bearing mobilisation. Four patients were managed with bed-to-chair transfer only. All five plates failed at an average of 32 days (range 15–42 days). Only one patient had an identifiable accident to account for the failure. Two patients underwent revision hip arthroplasty and two had revision fixation with Dall-Miles (Howmedica), and Cable Ready (Zimmer) plate and cables.

Femoral shaft peri-prosthetic fractures are not adequately stabilised with the Mennen plate system, and prolonged recumbency in such an elderly population often worsens pre-existing medical problems. We advocate the use of one of the many available plate and cable fixation systems for such fractures in the elderly and in those in whom revision arthroplasty may not be possible.

1. Introduction

The Mennen plate, or the para-skeletal clamp-on plate, was first described and introduced by U. Mennen in 1979 [1], as a means of internal fixation of fractures. Proposed as a means of achieving semirigid, and hence more biological stability, combined with a supposedly lesser operative dissection and soft-tissue stripping, the technique was advocated for forearm fractures. Since the plate was thought not to be load-sharing, its subsequent retrieval was thought unnecessary. Following this first description the plate was subsequently used to treat fractures of the humerus, metacarpals, fibula and the mandible. A study based at the CMW laboratories by Lam and Parkaystna established the Mennen plate as a suitable device for femoral peri-prosthetic fractures [2].

We describe the experience with the Mennen plate for peri-prosthetic femoral shaft fractures in a district general hospital.

2. Patients

Between 1993 and 1995 five patients with periprosthetic femoral shaft fractures were treated with Mennen plate fixation in Chase Farm Hospital. All clinical records and radiographs were retrieved retrospectively. The regimen recommended for postoperative mobilisation by the CMW laboratories was not adhered to strictly, due to patient-related concurrent pathologies. All five patients had concomitant medical problems, including hypertension, diabetes mellitus, atrial fibrillation, impending decubitus ulcers and chronic obstructive airways disease. Once the surgical wounds had settled, bed-rest was progressed to non-weight-bearing, achieved by one patient. The other four patients were unable to non-weight-bear and were allowed bed-to-chair transfer only. All five fixations

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Table 1

Patient	1	2	3	4	5
Age (yr)	88	79	82	80	75
Sex	F	M	F	F	F
Fracture type[a]	3a	3b	3b	3a	3b
Blood transfused	3 units	2 units	3 units	4 units	2 units
Bone graft	no	yes	no	no	no
Bed rest	11 d	14 d	10 d	14 d	10 d
Non-weight-bear	unable	unable	unable	unable	able
Failure	30 d	42 d	34 d	40 d	15 d
Hospital stay	76 d	57 d	48 d	72 d	28 d
Revision[b]	THR	DM	DM	CR	THR

[a] Fracture type is Beals and Tower classification [3].
[b] THR means total hip replacement, DM Dall-Miles plate and cables (Howmedica) and CR cable ready (Zimmer).

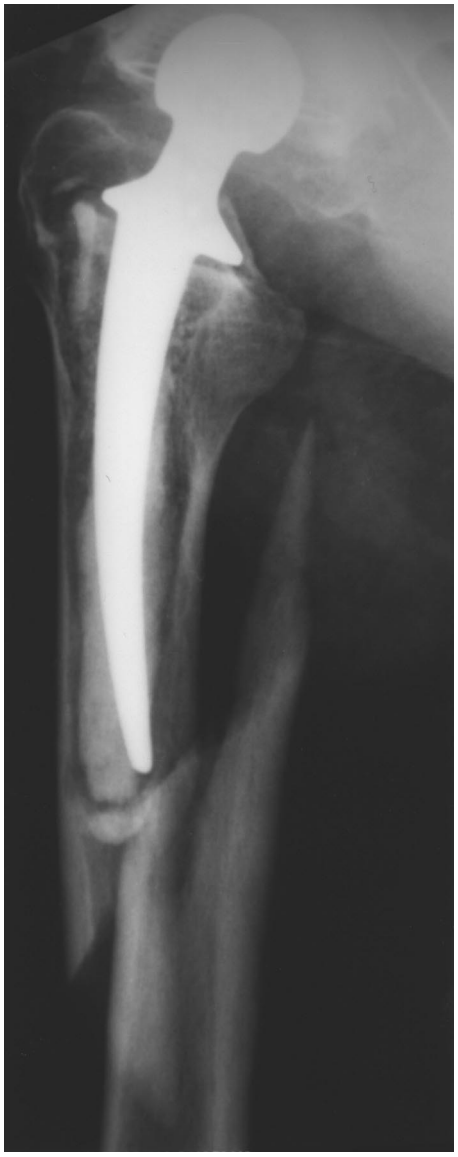

Fig. 1. Type 3b fracture [3].

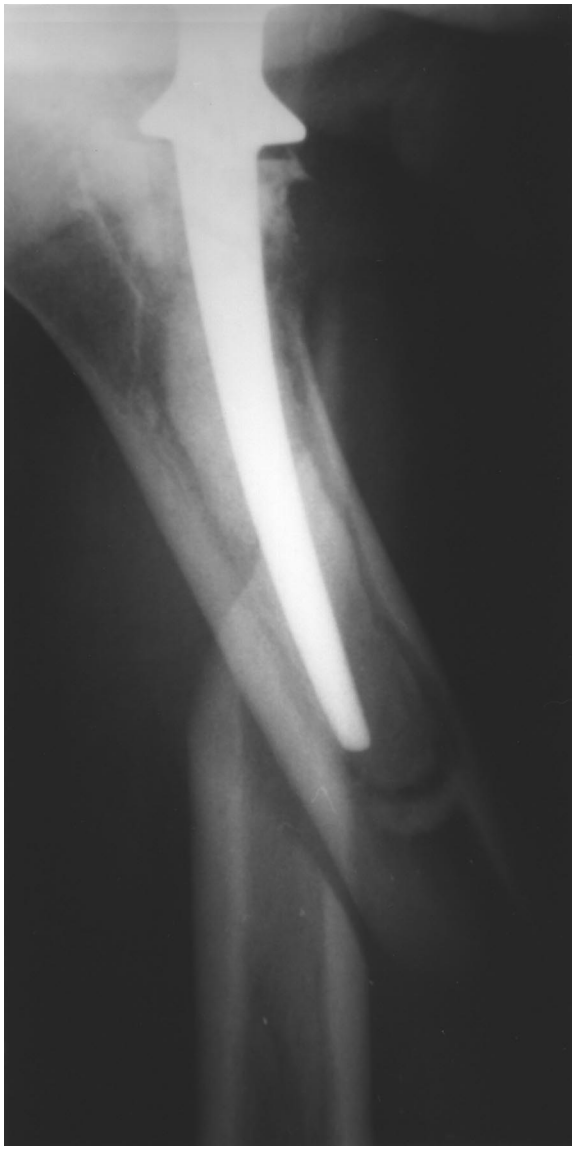

Fig. 2. Type 3b fracture [3].

failed at an average of 32 days, the earliest being at 15 days in the patient who was able to non-weight-bear, having stumbled on the ward. No direct precipitating events were held accountable for the failure of the remaining patients, who were transferred from bed-to-chair with the aid of nursing staff (Table 1).

3. Discussion

Periprosthetic femoral shaft fractures are variously managed, conservatively, by traction and spica casts, [4,5], and operatively. Operative management of these fractures is designed to provide immediate stability to the limb that enables early ambulation. The majority of patients suffering this type of fracture are elderly, with osteoporotic bone and loose hip arthroplasty

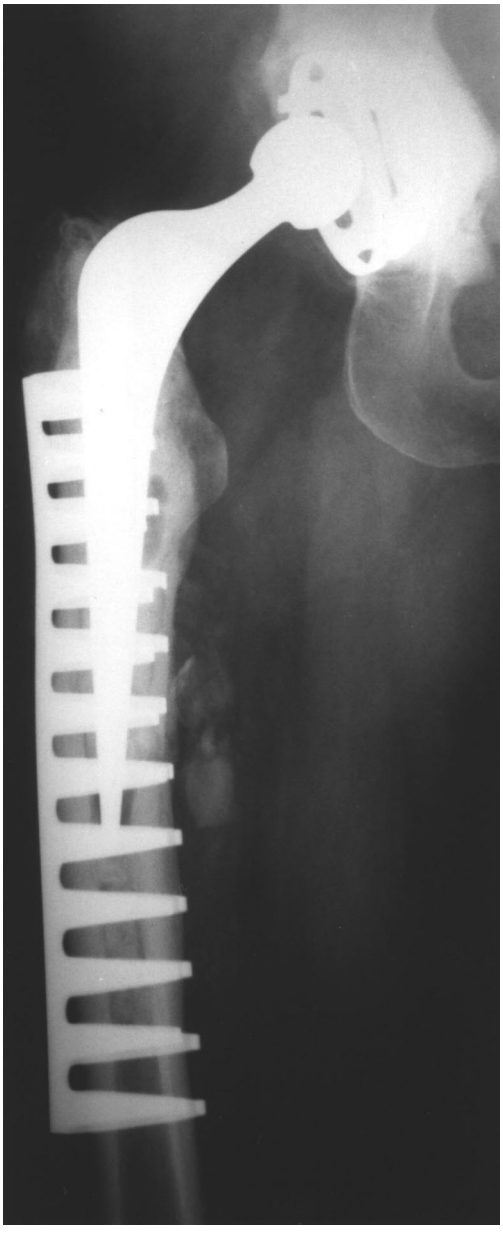

Fig. 3. Type 3b fracture stabilised with a Mennen Plate.

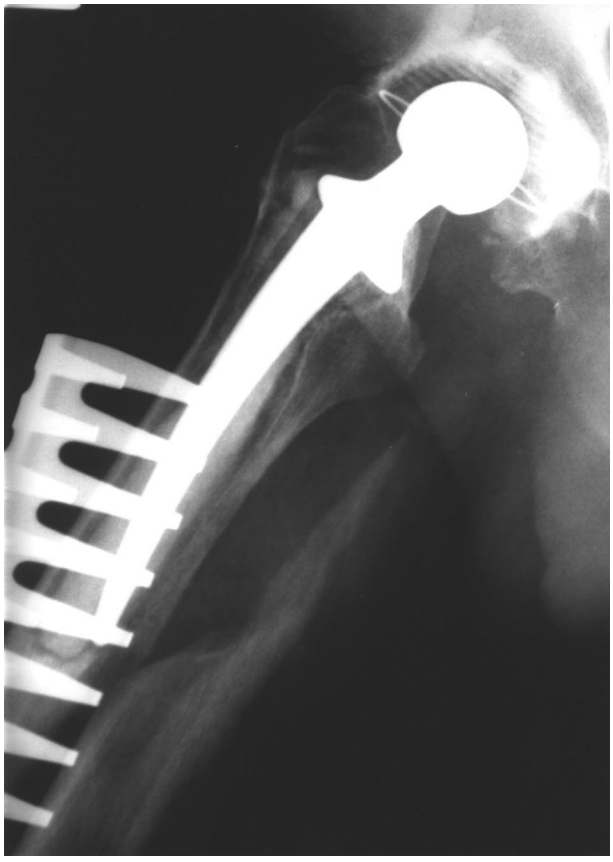

Fig. 4. Fixation failure at 34 days postoperation.

femoral components. Added to this is the concurrent pathology that many have pre-existent to their injury.

Mennen plate fixation of long bone fractures first appeared in literature in 1984, at which stage it was used to stabilise forearm fractures [1], although it was being used prior to this in 1979 [6]. The indication for its use was extended to femoral shaft fractures at the distal tip of femoral hip prostheses by Lam and Purkaystna [2]. Its use for femoral periprosthetic fractures has had mixed results. Radcliffe and Smith [7] reported five such fractures, although not classified, figures (Figs. 1–5) provided suggest type 3 fractures. All five fractures united at an average time of 4.5 months with no fixation failures. They were able to follow the postoperative regimen outlined by Lam and Purkaystna [2]. Dave et al. [8] reported the success of Mennen plate fixation in a 75-year-old lady following rigorous adherence to the original mobilisation protocol. The fracture was at the proximal tip of a stemmed femoral knee replacement component. Liu et al. [9] reported the failure of a 70-year-old female treated, with the Mennen plate and bone graft, for a type 3a fracture. Bed-to-chair transferring, aided by two nurses, was allowed and at four weeks, with no recognisable incident the fixation failed. A reoperation with a Mennen plate and additional cerclage wires bent to 50°.

The Mennen plate has many advantages including its ease of use, little soft tissue stripping from the fracture site, thereby preserving periosteal blood supply,

Many disadvantages have been recognised including no rotational control, little biomechanical support for load sharing, the need for adjunctive cast bracing and non-weight-bearing until callus is radiographically visible. The more important disadvantage of this type of fixation device is its high margin for error and fixation failure if there is any deviation from the exacting postoperative rehabilitation regimen. The periprosthetic fracture group of patients are generally elderly, frail and poorly able to cope with non-weight-bearing mobilisation. The Mennen plate offers a mode of fracture

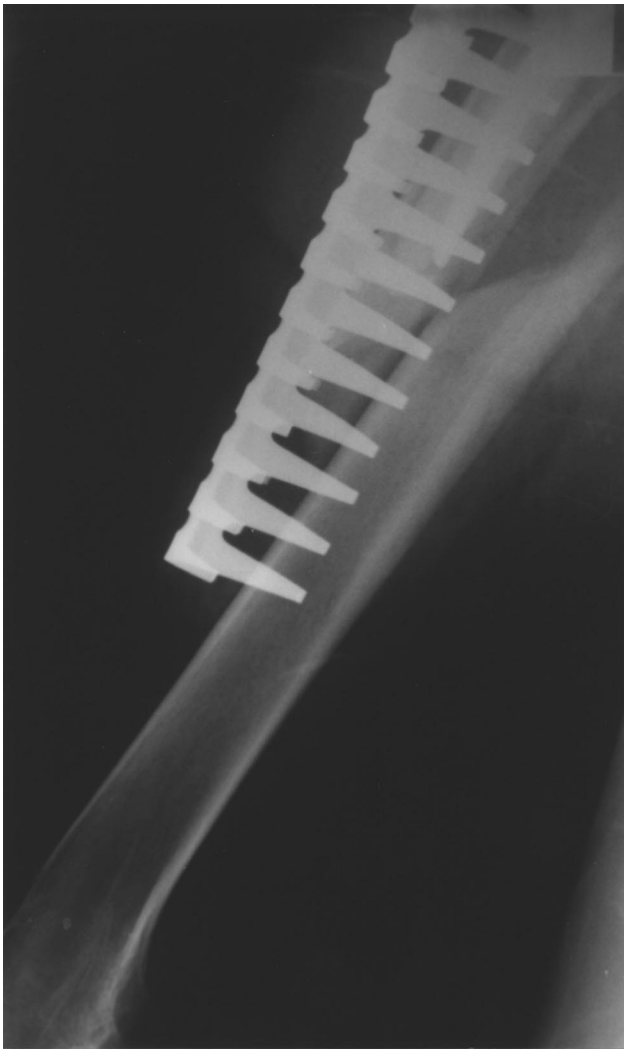

Fig. 5. Fixation failure at 34 days postoperation.

fixation that is less hazardous to the anaesthetically challenging patient than does the definitive option of revision arthroplasty. Unfortunately, it would seem, from our experience and that of Liu et al. [9], that failure of fixation does not necessarily follow any significant forceful event.

Many implants exist that allow firm peri-prosthetic fracture fixation, including the Ogden plate and Parham bands, Partridge cerclage system, Dall–Miles (Howmedica) and Cable Ready (Zimmer) plate and cable systems. These various devices have been reported with differing success rates when used for periprosthetic fracture fixation.

In conclusion, we feel that femoral periprosthetic fractures are not suitable for treatment with the Mennen plate. Fractures involving the shaft about the femoral stem tip are recognised to suffer a significant complication rate and are better managed with the more rigid fixation afforded by plate and cable fixation systems, thereby allowing earlier graduated weight-bearing. We abandoned the Mennen plate subsequent to these five failures, and now routinely use a plate and cable system.

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References

[1] Mennen U. The paraskeletal clamp-on plate. Part 2. Clinical experience with fractures of the radius and/or ulna. S Afr Med J 1984;66:170–2.

[2] Lam SJS, Purkaystna A. The Mennen plate: a unique indication for internal fixation. Dentsply, CMW laboratories, 1982.

[3] Beals RK, Tower SS. Periprosthetic fractures of the femur: an analysis of 93 fractures. Clin Orthop 1996;327:238–46.

[4] Johansson JE, McBroom R, Barrington TW, Hunter GA. Fracture of the ipsilateral femur in patients with toatl hip replacement. J Bone Joint Surg 1981;63A:1435.

[5] McElfresh EC, Coventry MB. Femoral and pelvic fractures after total hip arthroplasty. J Bone Joint Surg 1974;56A:483–7.

[6] Mennen U. Ten years experience with the clamp on plate. Orthop Prod News 1989;4:23.

[7] Radcliffe SN, Smith DN. The Mennen plate in periprosthetic hip fractures. Injury 1996;27(1):27–30.

[8] Dave DJ, Koka SR, James SE. Mennen plate fixation for fracture of the femoral shaft with ipsilateral total hip and knee arthroplasties. J Arthroplasty 1995;10(1):113–5.

[9] Liu AM, Flores M, Nadarajan P. Failure of the Mennen plate. Injury 1995;26(3):202–3.