

THE USE OF THE WAGNER REVISION PROSTHESIS IN COMPLEX (POST) TRAUMATIC CONDITIONS OF THE HIP

D. V. C. STOFFELEN, P. L. O. BROOS

Complex posttraumatic conditions in the proximal femur can be difficult to treat because of severe bone loss. A possible solution to this problem is the Wagner prosthesis. The results of 23 replacements in 22 patients are described. They were satisfactory in most cases for the given preoperative status. Using the Merle d'Aubigné scoring system, 17 results were good, while 6 were fair or poor, mostly related to problems in immediate mobilization due to the general condition of the patient.

Keywords : hip ; fractures ; revision prosthesis.

Mots-clés : fractures ; hanche ; prothèse de reprise.

INTRODUCTION

The incidence of hip replacements has gradually increased over the last years. Hip revisions will therefore become an important problem in the future. Multiple revisions can lead to extensive bone loss in the proximal femur (2). On the other hand, extensive proximal femoral bone destruction can also be caused by loosening of components, fractures around the stem of a prosthesis and comminuted fractures through the proximal femur. In all these cases, surgery becomes difficult.

Most authors seek to resolve this problem by using longer and larger implants filling the large resorption cavities by massive amounts of bone cement. However, this can lead to further bony destruction and loosening of the prosthesis with instability (1). Therefore, a cementless replacement may be regarded as a better solution.

Because of the destruction in the proximal femoral bone, bridging of the damaged area with distal fixation of the prosthesis must be achieved, leaving the proximal femur with relative mecha-

nical stability. One way of achieving this goal is the Wagner prosthesis (5).

In 1989, Wagner introduced a cementless revision hip system with a long femoral stem. The prosthesis is made of a high-strength titanium-aluminium-niobium alloy with excellent biocompatibility (4).

The stem has a 12/14 mm taper for the attachment of a prosthetic head with different neck lengths. The neck-shaft angle is 145°. The neck is followed by a proximal part with an oval cross-section with dorsal and ventral grooves which can be filled with bone grafts. The distal part, which will be inserted in the distal femur beyond the bone defects, consists of a conical shaft with eight longitudinal ribs to provide rotational stability. The entire prosthesis has a conical shape, and this together with the surface characteristics of every individual part, allows spontaneous stabilization.

MATERIALS AND METHODS

Since 1990 we used 23 Wagner prostheses in 22 patients for different indications (table I).

Fractures in and around a prosthesis were the most frequent indications (fig. 1). A loosened prosthesis associated with proximal bone defects was also replaced by a Wagner prosthesis. The Wagner prosthesis for primary fracture treatment was reserved for complicated lesions of the proximal femur, combined with fractures of the femoral neck or head (fig. 2).

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Table I. — Indications for the Wagner prosthesis

— Loosening of a prosthesis used for previous fractures	n = 5
— Fracture in or around a prosthesis	n = 9
— Primary treatment for comminuted fractures of the proximal femur combined with femoral head and/or neck fractures	n = 6
— Early and late complications of internal fixation for proximal femoral fractures	n = 3
- Gamma nail	n = 2
- Dynamic hip screw	n = 1

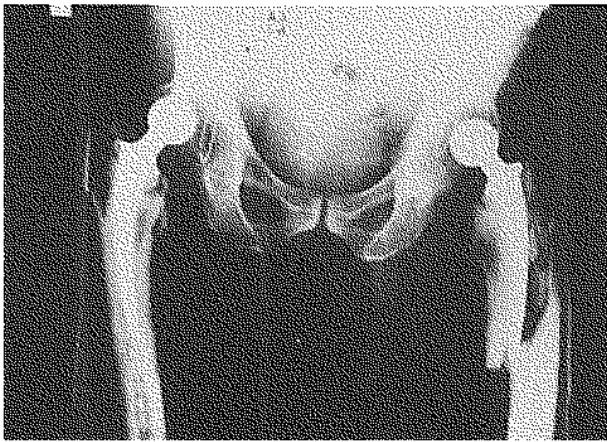


Fig. 1a. — Bilateral femoral fracture after hip replacement, treated with a bilateral Wagner prosthesis.



Fig. 2. — Comminuted fracture of the proximal femur combined with femoral neck fracture in an elderly patient.



Fig. 1b, c. — Radiographic result 1 year following surgery.

A Wagner prosthesis was also used for complications of internal fixation. Two failures after gamma nails and one after a dynamic hip screw were revised using a Wagner prosthesis because of extensive bone loss in the proximal femur (fig. 3).

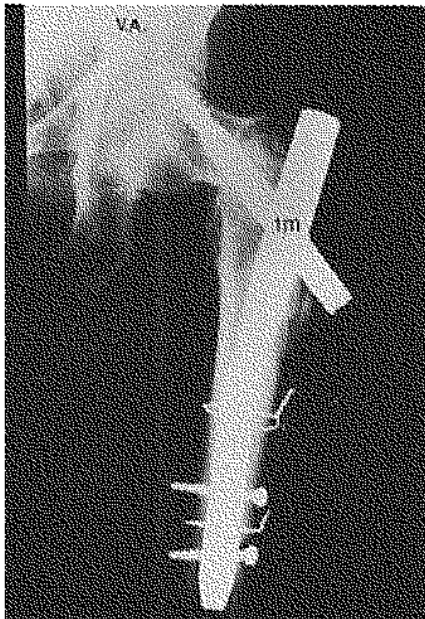


Fig. 3. — Failure of a gamma nail subsequently treated with a Wagner prosthesis.

The male/female ratio was 1/1.5, and the average age was 75 years (59-93).

The number of previous operations is listed in table II. Most of the patients already had a total hip replacement as their first and only operation before a Wagner prosthesis was inserted. One patient had undergone four revision replacements. Two patients had a failed gamma nail and one patient had a collapsed dynamic hip screw with a proximal bone defect.

The average time to revision after the first operation was 5.7 years.

RESULTS

Despite the difficulty of a multiple revision operation, the intraoperative complications were limited. They are listed in table II.

Table II. — Previous operations

— THR	14
— 4th Revision of THR	1
— Gamma nail	2
— Dynamic Hip Screw	1

Some of these complications were encountered while trying to apply other types of treatment, making the use of the Wagner prosthesis necessary.

The clinical evaluation was performed using the Merle d'Aubigné scoring system (3). The average follow-up was 19 months (12-38 months).

- 3 hips in 2 patients were excellent
- 14 were good
- 2 fair
- 4 poor

One patient died 3 weeks after surgery because of bowel ischemia. Four had a poor result mainly because of senile dementia making immediate postoperative mobilization almost impossible.

Because of the difficult problems for which a Wagner prosthesis is used, complications can occur (table III). During the operation there was one spontaneous femoral fracture and one perforation of the cortex on the lateral aspect of the femur. Both could however be treated with the Wagner prosthesis. In the postoperative period, there was one patient with recurrent dislocations leading to pressure sores followed by infection.

Table III. — Complications of the Wagner prosthesis

Peroperative complications	
— spontaneous fracture :	1
— perforation of cortex with reamer :	1
Postoperative complications	
— recurrent dislocation	1
— late infection :	1
— perforation of the knee joint :	1

Table IV. — Complications necessitating the Wagner prosthesis

— Attempt to other type of hip replacement	3
— Attempt to 95° angle blade plate	1

One patient developed a progressive protrusion of the prosthesis in the knee joint. This was treated by revision of the prosthesis with cement.

Because of the complex fractures in our group, other implants often failed during surgery (table IV). Four patients were first treated with another type of hip replacement (3 cases) or with an angled blade plate (1 case). However the implants had to be revised during the same operation because they did not provide enough stability in these complex fractures.

Radiographs showed indirect signs of bony on-growth in 16 cases. On these radiographs, no radiolucent lines could be demonstrated, whereas bone trabeculae were running along the prosthesis in an almost perpendicular fashion.

CONCLUSION

Bone loss in the proximal femur becomes a more and more important challenge for surgeons dealing with hip pathology in fracture care. The destruction can be due to loosening of a prosthesis with or without fractures after hip replacement, comminuted fractures involving the head, neck and proximal part of the femur or failures of internal fixation in this area.

One of the solutions for this problem is the Wagner prosthesis. The biomechanical characteristics and biocompatible aspects of the design make this replacement a valuable alternative for these difficult indications. Both surgery and rehabilitation are demanding, but a good final outcome can be achieved in most cases. A good result can however be achieved only when postoperative rehabilitation can be started immediately. Poor general condition prolonging bedrest impairs the result. Because of the high skills demanded for the operation, we believe that this procedure should be reserved for a highly experienced specialist, but every surgeon dealing with such patients should be aware of the possibilities of this system.

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SAMENVATTING

D. V. C. STOFFELEN, P. L. O. BROOS. Indicaties van de Wagner revisie prothese bij complexe posttraumatische heupafwijkingen.

Substantieel posttraumatisch botverlies in de regio van het proximale femur is dikwijls een probleem voor verdere behandeling. Een mogelijke oplossing hiervoor is het gebruik van de Wagner prothese.

De resultaten van 23 prothesen bij 22 patiënten worden besproken. De meerderheid van de resultaten was bevredigend. Indien men de Merle D'Aubigné score gebruikt behaalden 17 patiënten een goed resultaat. De 6 slechte resultaten gingen ondermeer samen met een moeizame postoperatieve revalidatie ten gevolge van de slechte algemene toestand.

RÉSUMÉ

D. V. C. STOFFELEN, P. L. O. BROOS. La prothèse de reprise de Wagner dans les lésions traumatiques complexes de la hanche.

Les atteintes post-traumatiques complexes du fémur proximal peuvent être difficiles à traiter par suite des

pertes de substance osseuse importantes. La prothèse de Wagner peut donner une solution à ces problèmes.

Les résultats de 23 implantations de cette prothèse chez 22 patients sont décrits. Dans la plupart des cas, les résultats furent satisfaisants compte tenu de l'état préopératoire. Suivant le tableau d'évaluation de Merle d'Aubigné, 17 résultats sont bons tandis que 6 patients ont des problèmes en relation avec leur état général.