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ORIGINAL ARTICLE

The Wagner Modular (S2) Prosthesis for Proximal Femur Bone Loss ; Prospective Study of 19 Cases

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ABSTRACT

Background: Wagner proximal femur prosthesis is the versatile modular implant.
Study Design: Prospective study
Setting: Department of Orthopaedic Surgery Dow University of Health Sciences / Civil Hospital Karachi, from January 2013 to December 2019.
Methodology: Total 19 patients of both genders with proximal femur bone loss due to tumor, implant failure for proximal femur fixation, comminuted intertrochanteric fracture, and failed arthroplasty included in the study. After taking written informed consent, detailed demographics including age, gender, indication of wagner prosthesis, and wagner stem type were recorded. Among all the patients 11 patients received total hip replacement and 8 patients received bipolar. Complications associated with procedure were recorded. Outcomes were assessed by Merle D Aubgine scale.
Results: Total 19 patients were included in the study who were operated with wagner prosthesis for proximal femur bone deficit problems. 7 (37%) patients were male and 12 (67%) were female , between age of 16 to 70. 13 (68%) patient have proximal femur problem on right side and 6(32%) patient on left side .10 Patient have proximal femur fixation problems and 9 with proximal femur tumor. Modular wagner prosthesis used in all patients . Per-operative one (5%) patient have perforation of cortex and One (5%)patient posterior hip dislocation on next day . Two (11%) patient had per-operative fracture . Maximum follow-up is from 6.3 years to minimum 6 months. One patient with metastasis died within four weeks of surgery. Outcome measured with modified Merle D Aubgine scale showed no excellent , good in 15(79%) , fair 3 (16%), poor 1(5%).
Conclusion: Wagner proximal femur modular implant is a versatile implant for proximal femur fixation failure and after proximal femur resection in tumor patients. It is modular with variable options to make stable hip joint. It is cheap as comparative to proximal femur replacement implant for tumor.
Keywords: Implant failure, Proximal femur, Tumor, Wagner implant.

INTRODUCTION

Stability is difficult to achieve in patient with revision replacement surgery at hip joint specially with proximal femur bone loss. [1,2] For that wagner revision stem is one of the options, The wagner femoral stem is straight , longitudinal flutes all around to provide rotational and tapered geometry to achieve axial stability. [3,4] Wagner introduced it as non- cemented implant in 1986. [5] The wagner stem covers the deficient proximal femur with purchase at diaphysis as well that maintains the abductors and quadriceps mechanics. [6] Due to its grit -blasted rough surface helps bone ingrowth.[7] Implants placed for proximal femur defects are associated with aseptic loosening and proximal migration. [8,9] Briding the proximal femur destruction with distal fixation provides proximal femur mechanical stability for that wagner is the viable option. [10,11]The objective of our study is to analyze our results of using wagner prosthesis in proximal femur bone loss due to fixation failure, after tumor resection and difficult proximal femur fracture .

MATERIAL AND METHODS

This prospective study was conducted at Department of orthopaedic surgery Dow University of health sciences / civil hospital Karachi from January 2013 to December 2019.

Total 19 patients of both genders with proximal femur bone loss due to tumor, implant failure for proximal femur fixation, comminuted intertrochanteric fracture, and failed arthroplasty were included in the study. Patients with infection around proximal femur were excluded.

After taking written informed consent, detailed demographics including age, gender, indication of wagner prosthesis, and wagner stem type were recorded. Among all the patients 11 patients received total hip replacement and 8 patients received bipolar. Complications associated with procedure were recorded. Outcomes were assessed by Merle D Aubgine scale. Data was analyzed by SPSS 24.0.

RESULTS

7(37%) patients were male and 12(67%) were female , between age of 16 to 70. 13(68%) patient have proximal femur problem on right side and 6(32%) patient on left side . Wagner proximal femur modular prosthesis used for dynamic hip screw failure 4 patients, comminuted intertrochanteric femur fracture 1 patient, 1 patient with girdlestone operated thrice for subtrochanteric fracture with dynamic hip screw first than with gamma nail, 1 patient with broken Austin moore prosthesis, 1 for loose uncemented total hip replacement with proximal femur fracture vancouver type IIB and 1 IIC, 1 patient with loose bipolar prosthesis uncemented. 9 patient have proximal femur

tumor that includes 2 patients with proximal femur metastasis from carcinoma breast, giant cell tumor 4 patients, 1 lymphoma, 2 osteosarcoma. 8 wagner implants used with total hip replacement and 9 with bipolar head replacement. 8 patients have cemented femoral wagner prosthesis used while 11 uncemented. Per-operative one (5%) patient have perforation of cortex and One(5%) patient with metastasis have posterior hip dislocation on next day and two(11%) patient had peroperative fracture. Maximum follow-up is from 6.3 years to minimum 6 months. One patient with metastasis died within four weeks of surgery. Outcome measured with modified Merle D Aubgine scale showed no excellent, good in 15(79%), fair 3(16%), poor 1(5%).

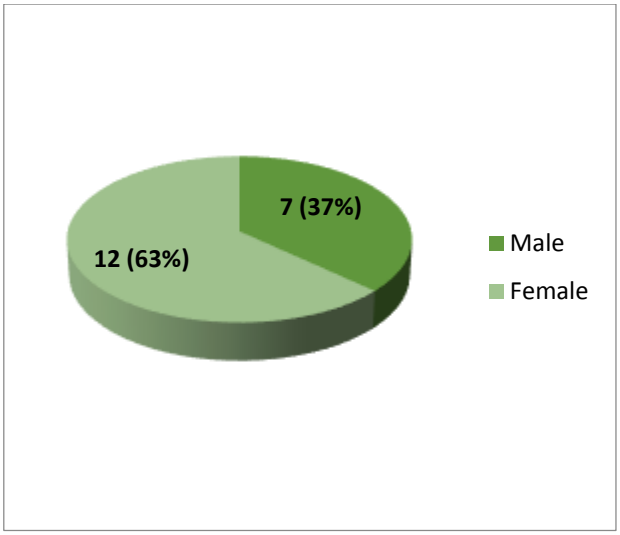

Figure No 1: Gender-wise distribution

Table 1: Indications of Wagner Prosthesis

Indication	Patient #
Periprosthetic Fracture	02
Proximal Femur fixation failure	06
Proximal femur tumor	09
Proximal femur Fracture	02

Table 2: Wagner Stem type

Wagner Uncemented	Wagner Cemented
12	07

Table 3: Wagner with Total Hip replacement & Bipolar

Wagner with THR	Wagner with Bipolar
11	08

Table 4: complications with Wagner prosthesis

Fracture	03(11%)
Cortex Perforation	01(5%)
Dislocation	02(5%)

Table 5: Outcome measured with modified Merle D Aubgine scale

Variables	Frequency (%age)
Excellent	0
Good	15(79%)
Fair	3 (16%)
Poor	1 (5%)

Figure 2: Postop with wagner prosthesis

Figure 3: Preoperative

DISCUSSION

The proximal femur reconstruction mostly done with modular implant and allograft composite reconstruction with luxury to reattach abductors to prosthesis [14].

In Taiwan; 22 patients with severe proximal femur bone loss due to loosening of implant and comminuted fracture treated with cementless wagner with mean followup of 7.1 years showing improved hip score but 2 patient have stem subsidence. It provides satisfactory results in 82 % of patients. 12

47 patients with osteoporotic intertrochanteric fractures treated with wagner prosthesis with 53.8% showed excellent hip score with favourable short term follow-up [13].

Study conducted at netherland for aseptic loosening of femoral stem treated 53 pateints with wagner with mean followup of 65 months showed improved hip score with 24.5% has subsidence with high revision in first year. Dislocation in 2 and false track in 1 patient [15].

Study at Seoul; conclude that wagner withconical stem and grit blasted surface provide satisfactory results with less mechanical failure [16].

7 years of study at two centers done 54 revision with wagner prosthesis, mean follow-up of 42.6 months with no subsidence [17].

Study conducted at Hongkong; 12 patients with periprosthetic fracture Vancouver type IIB treated with wagner prosthesis , 7 had excellent results. 1 patient had deep infection, 1 deep vein thrombosis, 1 had distal undisplaced femur fracture and 2 stem subsidence [18].

Patrick et al; evaluated 16 patients with of revision total hip arthoplasty showed 4 patient had peroperative fracture , 7 dislocations, 2 deep infection and 3 screw looseining [19].

Study conducted at Uppsala university treated 9 periprosthetic fracture with wagner showing no loosening [20].

94 wagner prosthesis long term followup of 11.5 years showed, cortical, hypertrophy, proximal femur atrophy , complete pedestal formation with radiolucies around stem, with the conclusion of promising results with wagner prosthesis [21].

Kurt Kolstad et al; used 31 wagner prosthesis for loosening, [23] had full range of motion, 2 had subsidence and dislocation followed by revision [22].

Retrospective data of 22 dysplastic hip treated with wagner stem is good to correct proximal femur deformities and address the shortening, with risk of dislocation [23].

Warren et al; recommends use of Dall miles cable wire 2mm or cerclage to prevent the subsidence of wagner femoral stem [24].

CONCLUSION

Wagner proximal femur modular implant is a versatile implant for proximal femur fixation failure and after proximal femur resection in tumor patients. It is modular with variable options to make stable hip joint. It is cheap as comparative to proximal femur replacement implant for tumor.

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