

Original Article
Orthopaedics

ANALYSIS OF SURGICAL TREATMENT OF IMPENDING PATHOLOGICAL FRACTURES OF THE PROXIMAL FEMUR DUE TO METASTASIS

T.M. Manohar¹, L. Kumar², Selvakumar², O. Obulivijayshankar³, P. Karthikeyan³

¹ - Associate Professor, Department of Orthopaedics, Government Mohan Kumaramangalam Medical College and Hospital, Salem

² - Assistant Professor, Department of Orthopaedics, Government Mohan Kumaramangalam Medical College and Hospital Salem

³ - Post Graduate, Department of Orthopaedics, Government Mohan Kumaramangalam Medical College and Hospital

Corresponding Author:

Dr.T.M.Manohar MS Ortho.,

Associate professor in department of Orthopaedics
Government Mohan Kumaramangalam Medical College and Hospital

Address: 34/97,sreerangapalayam main road
Sreerangapalayam west ,Salem -636007
Tamil nadu. Phone number: 09443232326.
tmmanoharortho@gmail.com

Article submitted on: 07 December 2016

Article Accepted on: 26 December 2016

Abstract:

Introduction: Owing to the advances in the cancer diagnosis and treatment, the survival rate of the patients have been increased substantially. Nearly 75 percent of the patients with malignancy have metastatic lesions which cause intractable pain and functional impairment. Most of the patients have been managed conservatively with chemotherapy and radiotherapy. However, surgical treatment is a good option for patients with metastatic or impending pathological fractures, and solitary metastatic lesions. Complete metastatic workup has to be done and the most common primaries are in the breast, prostate, lung, kidney, colon etc. the main goal of the treatment is to provide near painfree, healthy and ambulant life to take care of their basic needs. The proximal femur is a frequent site of bone metastases. Intramedullary nailing of the femur proves to be the best surgical option in the pathology involving the proximal femur.

Aim of the study: To prospectively analyse the clinical outcome of patients with metastatic proximal femur disease after intramedullary nailing.

Materials and methods: 10 Patients with proximal femur impending pathological fracture admitted to Government Mohan Kumaramangalam Medical College and Hospital, Salem have been taken for this study after obtaining their informed written consent. This is a prospective study done from June 2008 to June 2016.

Results: 10 patients were included in the study. The primary malignancies of these 10 patients were as follows

4- Bronchogenic carcinoma

2- Renal carcinoma

2- hepatocellular carcinoma

2- colon carcinoma and mean age of the patients was 58 yrs.

7 were male patients and 3 were female. Intramedullary nailing of femur was done for all the 10 cases.

The patients were followed up for 36 months.

1 patient developed infection. 2 patients died during the first year post surgery. The mean musculoskeletal tumour society score was 23.6.

Conclusion: Surgical intervention is necessary for these patients to lead a painfree and Ambulant life. In this study, the patients tolerated the surgery well in terms of health as well as emotional aspect. The improvement in the quality of life in these patients are increases many folds.

Key words: Pathological fracture, proximal femur, metastasis

Introduction:

Impending fractures of the long bones and vertebra are a common complication of many primary malignant tumours. Axial and appendicular skeleton is the most common site of metastasis. With increased knowledge and expertise in cancer management diagnosis and management is easier. The quality and independency of life is curtailed to a great extent by pathological or impending pathological fracture. Many methods of treatment are available for impending pathological fracture. Intramedullary fixation is a useful solution for palliation being less invasive and allowing early weight bearing to preserve independence as long as possible. Fixation of long bone fractures usually can be accomplished with minimal blood loss or morbidity, thereby improving quality of life of the remaining months significantly.

Immediate fixation provides benefits in terms of pain relief, restoration of ambulatory function, psychological improvement and facilitation of nursing care. intramedullary nailing is the most accepted fixation method, because of its ease of insertion and loadsharing

properties.

This study shows clinical improvement in the life of the patient following prophylactic stabilization of impending femur fractures with intramedullary nailing.

Harrington’s criteria for predicting risk of fracture are Cortical bone destruction > 50% ,A lesion > 2.5 cm in the proximal femur, Destruction of subtrochanteric femoral region and Persistent pain despite irradiation.

Materials and Methods:

This is a prospective study done at Government Mohan Kumaramangalam medical college and hospital, salem, Tamil nadu from June 2008 to June 2016 after obtaining valid informed written consent from the patient.

Inclusion criteria :

1. Skeletally mature adults(both men and women)
2. Impending pathological fracture proximal femur due to metastasis

Exclusion criteria :

1. Impending fractures of the proximal femur because of the primaries.
2. Pathology in other sites of the

same limb.

3. Patient medically unfit for surgery.

Surgical technique:

Surgery was advised for all impending pathological fractures and whose chance of survival is more than 3 months.

The Aims of the surgery is to provide pain relief, improvement in the range of movements and independent mobilisation.

- Patient supine on a fracture table.
- Parts painted and draped.
- Pathological site visualized under C-Arm guidance.
- Incision made over greater trochanter.
- Fascia split.
- Entry made with curved bone awl.
- Guide wire passed.
- Nail inserted.
- Bone biopsy obtained through a separate skin incision.
- Wound was given.
- Wound closed in layers.

Results:

Patients were evaluated using the musculoskeletal tumour society score evaluate the quality of life of the patients in all aspects.

Score	Pain	Function	Emotional	Supports	Walking	Gait
5	No pain*	No restriction	Enthused*	None*	Unlimited	Normal
4	Intermediate	Intermediate*	Intermediate	Intermediate	Intermediate*	Intermediate
3	Modest/Non-disabling	Recreational restriction	Satisfied	Brace	Limited Minor cosmetic	
2	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate	Intermediate*
1	Moderate/Disabling	Partial restriction	Accepts	One cane or crutch	Inside only	Major cosmetic
0	Severe disabling	Total restriction	Dislikes	Two canes or crutches	Not independent	Major handicap

*represent the score in our patient

The results were as follows

Age	Gender	Primary neoplasm	Duration of symptoms	Walking aids	Musculoskeletal tumour society score	Age of survival
47	Male	Renal	3	Crutch	21	9 months
55	Male	Hepatocellular	6	Nil	26	2 years
52	Female	Colon	5	Walker	22	1 year 2 months
63	Male	Renal	1	Nil	24	Alive
48	Male	Bronchogenic	5	Nil	23	Alive
70	Female	Bronchogenic	2	Nil	26	Alive
56	Female	Colon	3	Nil	25	Alive
60	Male	Hepatocellular	4	Walker	20	1 year 4 months
64	Male	Bronchogenic	4	Nil	26	Alive
69	Male	Bronchogenic	6	Walker	23	1 yr 8 months

- The mean musculoskeletal society score was 23.6. and five patients died during follow up.
- Six patients returned to the previous injury state after surgical intervention.
- Mean age group of the patients involved was 58.4 years.

Discussion:

Cephalomedullary implants are used in stabilizing the proximal femur fracture because of the rationale that the entire neck and shaft is stabilized.

In case of the proximal femur pathology with acetabular involvement arthroplasty is the procedure of choice and if plating is opted for pathological fracture there is increased risk of fractures at the end due to stress risers.

Since the pathology in the bone causes severe pain and increases risk in fractures during weight bearing, fixation of the femur is essential to prevent further distress to the patient and to resume his day to day activities.

The morbidity of the patients is less in prophylactically fixed fractures rather than fixing the bone after fracture.

Patients whom require prophylactic nailing is determined by the use of

Harrington or Mirel's criteria. In our study Harrington criteria has been used which states that fixation is mandatory if there is destruction of more than 50% of the cortex, lesion size more than 2.5cms, lesion in the subtrochanteric region and persistent pain despite radiation therapy to the lesion in the bone.

It is of importance to stress on the anatomic location of the bony lesions for the assessment of potential fractures. As the lower limbs to support body weight for ambulation, so, lesions in these areas are at increased risk for pathological fracture, specifically, those lesions in the proximal femur which are considered to be at the greatest risk for fracture among all long bone lesions. The most important factor in the surgical management is the general condition of the patient, the patients activity level before the onset of symptoms. If the patient is very active and mobilisation is severely restricted due to pain, surgical treatment with load sharing implant ensures pain free mobilisation in the last stage of life.

Conclusion:

Intramedullary nailing system

fulfilled our objectives of providing pain relief, ambulation and good functional improvement. There were no technical difficulties in our procedure. all the patients experienced a good quality of life post surgery and intramedullary nails proves to be the best in metastatic disease of proximal femur because of minimal dissection required and load sharing property which is the requirement in treating patients with pathological fracture.

Illustrations:



Figure 1: Anteroposterior view of the pelvis with both hips showing lesser trochanter avulsion fracture on the right side.

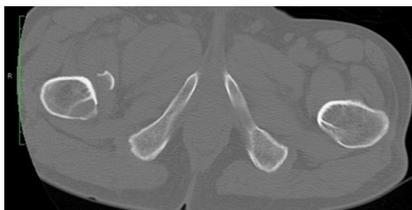


Figure 2: Computed Tomography Axial view showing osteolytic lesion in the base of the avulsed lesser trochanter



Figure 3: Computed Tomography Coronal view of the pelvis showing lesser trochanter avulsion fracture



Figure 4: Magnetic resonance imaging coronal view of the pelvis with both hips showing lesion in the lesser trochanter base

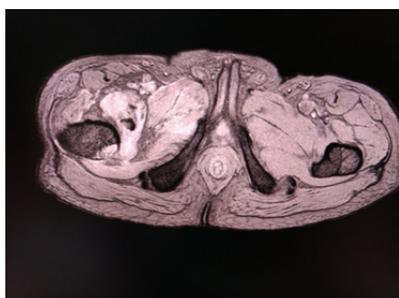


Figure 5: Magnetic resonance imaging axial view showing avulsed lesser trochanter



Figure 6: Post operative plain radiograph of pelvis with both hips showing proximal femoral nail in situ



Figure 7: Plain radiograph lateral view of right hip showing proximal femoral nail in situ



Figure 8: Clinical photo of the patient bearing weight after surgery

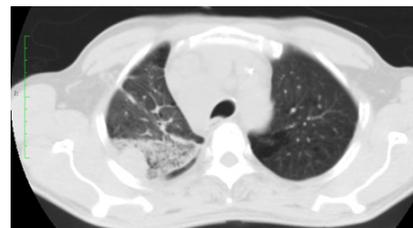


Figure 9: Computed Tomography axial view of the chest showing lesion in the posterior aspect of the superior lobe

References:

1. Beals RK, Lawton GD, Snell WE. Prophylactic internal fixation of the femur in metastatic breast cancer. *Cancer* 1971;28:1350–4.
2. Habermann ET, Sachs R, Stern RE, Hirsh DM, Anderson WJ. The pathology and treatment of metastatic disease of the femur. *ClinOrthopRelat Res* 1982;169:70–82.
3. Jaffe HL. *Tumours and tumours condition of bones and joints*. Philadelphia: Lea and Febiger; 1958.
4. Lane JM, Sculco TP, Zolan S. Treatment of pathological fractures of the hip by endoprosthesis replacement. *J Bone Joint Surg Am* 1980;62:954–9.
5. Samsani SR, Panikkar V, Georgiannos D, Calthorpe D. Subtrochanteric metastatic lesions treated with the long gamma nail. *IntOrthop* 2003;27:298–302.
6. Karachalios T, Atkins RM, Sarangi PP, Crichlow TP, Solomon L. Reconstruction nailing for pathological subtrochanteric fractures with coexisting femoral shaft metastases. *J Bone Joint Surg Br* 1993;75:119–22.
7. Van der Hulst RR, van den Wildenberg FA, Vroemen JP, Greve JW. Intramedullary nailing of (impending) pathologic fractures. *J Trauma* 1994;36:211–

- 5.
8. Weikert DR, Schwartz HS. Intramedullary nailing for impending pathological subtrochanteric fractures. *J Bone Joint Surg Br* 1991;73:668–70.
9. Behr JT, Dobozi WR, Badrinath K. The treatment of pathologic and impending pathologic fractures of the proximal femur in the elderly. *ClinOrthopRelat Res* 1985;198:173–8.
10. Broos P, Reynders P, van den Bogert W, Vanderschot P. Surgical treatment of metastatic fracture of the femur improvement of quality of life. *ActaOrthopBelg* 1993;59(Suppl 1):S52–6.