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### RESEARCH ARTICLE

#### SURGICAL MANAGEMENT OF PATHOLOGICAL FRACTURE OF DISTAL FEMORAL DIAPHYSIS WITH METASTASIS - A CASE REPORT

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#### Abstract

**Introduction:** The femur is the most common bone affected by a metastatic carcinoma and subsequently resulting into a pathological fracture of the bone which directly affects the daily activities of the cancer patient. Pathological fractures caused by metastatic events usually occur in late stage of the disease which are also accompanied by symptoms like severe pain, instability and loss of function. Several factors are considered in the treatment of femoral metastasis, including the location of the lesion, estimated prognosis, nature of the fracture – complete or impending and general condition of the patient.

**case report:** We have a case of a 62-year-old male patient who presented to us with the chief complaint of pain in the left thigh since 5 months with no history of significant trauma was found to have distal third femur shaft pathological fracture with a metastatic lesion on MRI who was operated with intra-medullary interlock nail. The patient was started with partial weight bearing walker mobilization on POD3. The patient was able to bear full weight over the operated limb and there was significant reduction in the pain after 1 week post op and the follow up x-ray after 2 months of surgery showed some signs of bridging callus over the lesion and the patient was sent for further evaluation of the suspected unknown primary.

**Conclusion:** As is evident from the above case, patients with a pathological femur fracture operated with an intra-medullary implant were shown to have a significant achievement of pre operative goals of our surgical intervention in the form of reduction of pain, regaining of the range of motion of the affected joints, full weight bearing over the affected limb and a better quality of life with improvement in performance of activities of daily living.

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#### Introduction:-

Bone metastasis is a dreaded complication of a malignant disease, the precise incidence of which is unknown. Estimates from various studies have concluded that around half of the patients with a malignant disease will develop metastasis and around half of them will arise in the skeletal system. Bone metastases seldom cause mortality but dramatically affect the quality of life, cause loss of function and significant pain warranting some form of medical or surgical management.<sup>[1]</sup> The femur is the most common bone affected by a metastatic carcinoma and subsequently resulting into a pathological fracture of the bone which directly affects the daily activities of the cancer patient. In femur the proximal femur fractures are commoner than diaphyseal, which in turn are commoner than distal femur

metaphyseal fractures.<sup>[2]</sup> Improvement in the treatment of the primary tumours along with improved results in skeletal related metastatic events. Pathological fractures caused by metastatic events usually occur in late stage of the disease which are also accompanied by symptoms like severe pain, instability and loss of function. Several factors are considered in the treatment of femoral metastasis, including the location of the lesion, estimated prognosis, nature of the fracture – complete or impending and general condition of the patient.<sup>[3]</sup> The treating surgeon should consider the principles of pathologic fracture fixation before initiating treatment. When considering surgical fixation of such fractures, the abnormal healing environment of the diseased bone should be taken into account and the goal of fixation should be providing rigid mechanical construct that helps reduce the patient's pain and allowing him to bear weight.<sup>[4]</sup>

### Case Report

We have a case of a 62-year-old male patient who presented to us with the chief complaint of pain in the left thigh since 5 months with no history of significant trauma was found to have distal third diaphyseal femur shaft pathological fracture (Fig.1) with a metastatic lesion on MRI who was operated with intra-medullary interlock nail. The patient was started with partial weight bearing walker mobilization on POD3. The patient was able to bear full weight over the operated limb and there was significant reduction in the pain after 1 week post operatively and the patient was sent for further evaluation of the suspected unknown primary. The follow up Xray after 2 months of surgery showed some signs of bridging callus over the lesion.

### Surgical procedure –

Before posting the patient for surgery, initial work up was done for the patient which included MRI scan – to delineate the exact extent of the soft tissue involvement and CT scan to look for the extent of the bony involvement and rule out any other bony pathology. MRI (Fig. 2) and CT scan (Fig. 3) both showed a pathological fracture of the distal third shaft of femoral diaphysis along with a metastatic lesion at the fracture site. The patient was posted for surgery after obtaining due fitness.

The patient was placed in a supine position over the operating table. Induced under all aseptic precautions and under spinal and epidural anaesthesia. Scrubbing, panting and draping were done. The patient's limb was attached to a fracture table but traction was not given in view of minimal overriding of the fracture fragments. Incision was taken 4-5cms above the greater trochanter. A pyriform fossa entry point was chosen as a straight intra-medullary interlocking nail was used. After taking entry with an entry awl, guide wire was inserted. Only the proximal reamer was used to ream the proximal third of the shaft. Extensive reaming distally was not performed so as to avoid the dissemination of the probable soft tissue metastatic components. Anadequately sized nail was used to reduce and fix the fracture.(Fig. 4)Through a mini-incision procedure at the fracture site, curettage was done and soft tissue and bone fragments were retrieved for histopathological examination of the same. The immediate post operative period was unremarkable and the patient was started on hip and knee rom on POD-2. Partial weight bearing was started on POD-3. After 1 week post op, patient experienced significant reduction in the pain and was able bear full weight over the operated limb. After suture removal, patient was sent for further work up for the unknown primary at a higher centre. The follow up x-ray after 2 months(Fig. 5) of surgery showed some signs of bridging callus over the lesion and the patient had regained full range of motion(Figs. 6&7) over the affected joints and was able to maintain the full weight bearing(Fig. 8) started for him after 1 week post operatively.

### Discussion:-

Femoral metastases are difficult to manage as most of them are lytic in nature and quite often induce intractable pain and functional impairment, more so in those having a pathological fracture. The patients who have received non-surgical management often tend to be bed-ridden for a long time further deteriorating their general condition and giving rise to other complications like bed sore, deep vein thrombosis, urinary infection, and lung atelectasis. In addition to the aforementioned major drawbacks here, one major morbidity which is associated with these diaphyseal femoral fractures is the immense pain and inability to move the joints above and below the lesion. This causes significant reduction in the ability to perform activities of daily living. In order to alleviate the patient of these morbid pain and the subsequent functional disabilities, surgical intervention is indicated as soon as possible, after the initial work up for the patient is done. Therefore, surgical management, either palliative or as a definitive management if the life expectancy is expected to be much more than time required for post operative rehabilitation, is warranted in many cases, unless the patient is medically unfit for surgery. The surgical fixation plan must also take into account the status of the soft tissues around the fracture site. Most diaphyseal fractures of the femur could be treated with an intramedullary device. Swanson, K C et al concluded in their study that the surgical construct has

to be stable enough so as to provide immediate full weight bearing status to the patient and be durable enough to last his expected lifespan. [5] This intramedullary nailing could be ante grade or retrograde. Gibbon et al [6] operated 49 consecutive patients from 1993 to 1998 with a pathological complete or impending femur metastatic fracture with intra-medullary nailing and obtained a good functional result in all of them in terms of relief of pain and improved mobility. Nailing allows minimally invasive surgery while obtaining near normal results as in a traumatic non pathological fracture. One of the drawbacks of treating patients with metastatic pathological fracture is that the cortical discontinuity at the lesion may never heal as in a normal bone and might result in the patient having chronic pain and functional disability of varying degrees. The fractures of the femoral diaphysis are acted upon by axial weight bearing forces and rotational torque. [7,8] Therefore long intramedullary devices should be used in order to span the entire length of the bone so as to provide structural integrity to the bone strong enough for the patient to bear weight in the post operative period. Also, local excision and biopsy of the tumour should be considered. Because of high frequency of non-union in such fractures, reconstruction nail has been recommended by some studies in order to provide better structural support to the bone. [9] The treatment of diaphyseal femoral fractures with intramedullary devices is known to reduce pain and improves the quality of life in patients with femoral metastases. This fixation is not without any complications which include infection, bleeding, recurrence or dissemination, deep vein thrombosis, implant breakage but surgical palliation obtained with such fixations outweighs the complication risk and patient can have a better outcome for the remainder of his/her life. The treatment of pathological fractures requires a multi-disciplinary approach with the major role of orthopaedists being that of alleviating pain and providing functional rehabilitation for the patient. It is necessary for the patient to undergo further medical and radio therapeutic evaluation and management in order to treat the residual disease, if any so as to improve his quality of life and increase the life expectancy. [10]



**Figure 1:-** Pathological fracture of the femoral diaphysis in the distal third shaft.



**Figure 2:-** MRI scan showing pathological fracture of femur diaphysis with metastatic lesion [sagittal, axial, coronal section].



**Figure 3:-** CT scan showing images of the pathological fracture in the femur diaphysis [sagittal, coronal, axial view].



**Figure 4:-** Immediate post op x-rays showing intra-medullary nailing of the fracture.

**Figure 5:-** 2 month follow up x-ray showing bridging callus over the fracture site [signs of union].



**Figures 6&7:-** Patient showing full range of motion at the hip and knee joint and being able to squat 2 months post op.





**Figure 8:-** Patient able to fully bear weight over the affected limb with significant reduction in pain and subsequent improvement in daily activities 2 months post operative.

#### **Competing Interests:**

The authors declare that they have no competing interests.

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Nil.

#### **Conclusion:-**

As is evident from the above case, patients with a pathological femur diaphyseal fracture have associated intractable pain and functional disabilities which needs urgent operative intervention in order to relieve the patient of this significant morbid condition and also to allow early resumption/start of the cancer treatment. Thus, patients operated with an intra-medullary implant were shown to have a significant achievement of pre operative goals of our surgical intervention in the form of reduction of pain, regaining the range of motion of the joints above and below the lesion, full weight bearing over the affected limb and a better quality of life with improvement in performance of activities of daily living.

#### **Clinical message:**

The aim of any management plan should be to reduce the morbidity of the patient to as much as extend as possible in order to enable him to endure the mental, physical and economical stress of undergoing various further modalities of treatment procedures in due course, in this case, the subsequent requirement of the patient to go through the chemo/radiotherapeutic procedures for his malignancy.

#### **References:-**

1. Rikard Wedin (2001) Surgical treatment for pathologic fracture, *Acta Orthopaedica Scandinavica*, 72:sup302, 1-29, DOI: 10.1080/000164702760300302
2. Julie J Willeumier<sup>1</sup>, C W P Gerco van der Wal<sup>1</sup>, Jan W Schoones<sup>2</sup>, Robert J van der Wal<sup>1</sup>, P D Sander Dijkstra *J Surg Oncol* 2018 Nov;118(6):883-890. doi: 10.1002/jso.25218. Epub 2018 Oct 17.
3. Masashi Morishige, Keiichi Muramatsu, Yasuhiro Tominaga, Takahiro Hashimoto and Toshihiko Taguchi *Anticancer Research* January 2015, 35 (1) 427-432
4. John alanscolaro, Richard D. Lackman, *J Am Acad Orthop Surg* 2014;22:90-100, <http://dx.doi.org/10.5435/JAAOS-22-02-90>
5. Swanson, K C et al. "Surgical treatment of metastatic disease of the femur." *The Journal of the American Academy of Orthopaedic Surgeons* vol. 8,1 (2000): 56-65. doi:10.5435/00124635-200001000-00006.

6. Gibbons, C E et al. "Femoral metastatic fractures treated with intramedullary nailing." International orthopaedics vol. 24,2 (2000): 101-3. doi:10.1007/s002640000114
7. Gainor BJ, Buchert P: Fracture healing in metastatic bone disease. ClinOrthopRelat Res 1983;178:297-302.
8. Harrington KD :Orthopedic surgical management of skeletal complications of malignancy. Cancer 1997;80[8 suppl]: 1614-1627.
9. Keene J S, Sellinger DS, McBeath AA. Metastatic breast cancer in the femur: a search for the lesion at risk of fracture. ClinOrthop 1986; 203: 282-8.
10. P.Anract<sup>a</sup>D.Biau<sup>a</sup>P.Boudou-Rouquette<sup>b</sup>, Orthopaedics & Traumatology: Surgery & Research Volume 103, Issue 1, Supplement, February 2017, Pages S41-S51.