

## Case Report

# Operative management of chondrosarcoma in pelvic region: case series

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### ABSTRACT

Chondrosarcoma is the second most frequent malignant bone tumour after osteosarcoma. It most often occurs in the pelvis. Treatment of pelvic chondrosarcoma is a difficult problem for the musculoskeletal oncologist. We report 3 patient with chondrosarcoma in pelvic region that undergoing internal hemipelvectomy. First patient, male 28 y.o. with chondrosarcoma in left iliac wing 11.2cm x 10.8cm x 9.2cm. Second, woman, 47 y.o with chondrosarcoma in right superior and inferior pubic rami 13.7cm x 11.5cm x 14.2cm with soft tissue mass around extended to medial part of proximal thigh. Already done A wide excision of the tumor was performed and we use non-vascularized fibular graft (NVFG) to fill the defect. Last patient, pregnant woman 22 y.o. (16weeks gestational age) with chondrosarcoma in right pubic rami 9.8cm x 11.4cm x 13cm. We already done internal hemipelvectomy without terminating the fetus. The second and third patient confirmed with the histopathology result with chondrosarcoma grade II, and the first patient with chondrosarcoma grade I. After 3month post operatively, all of the patients have no pain, no urinary tract complain. The first patient can ambulatory full weight bearing with no crutches or walker. Second patient ambulatory partial weight bearing with crutches. The last patient ambulatory with wheel chair during the pregnancy. Since chondrosarcomas are unresponsive to chemotherapy or radiotherapy, surgical resection was the only therapeutic solution for these patients. It also reinforce the need of a correct diagnose and collaboration between specialities in the treatment of oncological patients.

**Keywords:** Chondrosarcoma, Hemipelvectomy, Non-vascularized fibular graft

### INTRODUCTION

Chondrosarcoma is the third most common primary bone malignancy after myeloma and osteosarcoma. More than 90% of the chondrosarcoma are idiopathic, which grow slowly, with less transfer and a relatively good prognosis. Accounting for approximately 20% of bone sarcomas and mainly affecting the middle-aged population.<sup>1</sup> The primary chondrosarcoma usually happens to adults and elderly man aged between 40 and 70 years. Most of chondrosarcoma is found at pelvis (iliac bone involved most frequently), followed by proximal femur, proximal humerus, distal femur and ribs. The mass was the main manifestation. The course was slow and the pain was not obvious. Chondrosarcoma occurs in the marrow

mesenchymal tissue or synovial membrane. They are subclassified into mesenchymal, dedifferentiated, myxoid, clear cell, and synovium subtypes.<sup>2</sup> It comprises a heterogeneous group of neoplasms that are characterized by cartilage matrix production from the tumor cells.<sup>1,3</sup> The pelvis is the commonest site of occurrence with the ilium being the most frequently involved bone, followed by the pubis and ischium. Chondrosarcomas can either arise de novo as primary tumors, or less frequently, they can originate from previously existing benign cartilaginous tumors such as osteochondromas and enchondromas.<sup>1,4</sup>

Despite advances in surgical technique and adjuvant therapy, resection of a malignant pelvic tumour remains a

significant challenge. The potential for major intra-operative complications, such as injury to the iliac vessels, is high, and the need for lengthy rehabilitation is common. Consequently, patients need to be cared for by a multidisciplinary team. Limb-sparing internal hemipelvectomy, with reconstruction of the pelvis, is a standard treatment for malignant pelvic tumours, whenever wide resection margins can be achieved.<sup>5</sup> Its advantages over amputation include preservation of the ability to walk and a decrease in the cosmetic and psychological side effects. Limb-salvage surgery has replaced amputation for radical treatment of malignant pelvic tumors along with the introduction of effective chemotherapy, imaging modalities and modern surgical techniques.<sup>5</sup>

However, limb-salvage surgery for malignant pelvic tumors is still challenging because of their large size at diagnosis, the complex anatomy of the pelvis, and closely-situated vital organs such as vessels, nerve bundles, and viscera. In patients undergoing limb-salvage internal hemipelvectomy, pelvic reconstruction is mandatory to maintain the stability of the pelvis and the spinal column to re-establish a continuity of the ilium, the sacrum, and the pubis, which finally expected to achieve a good functional outcome.

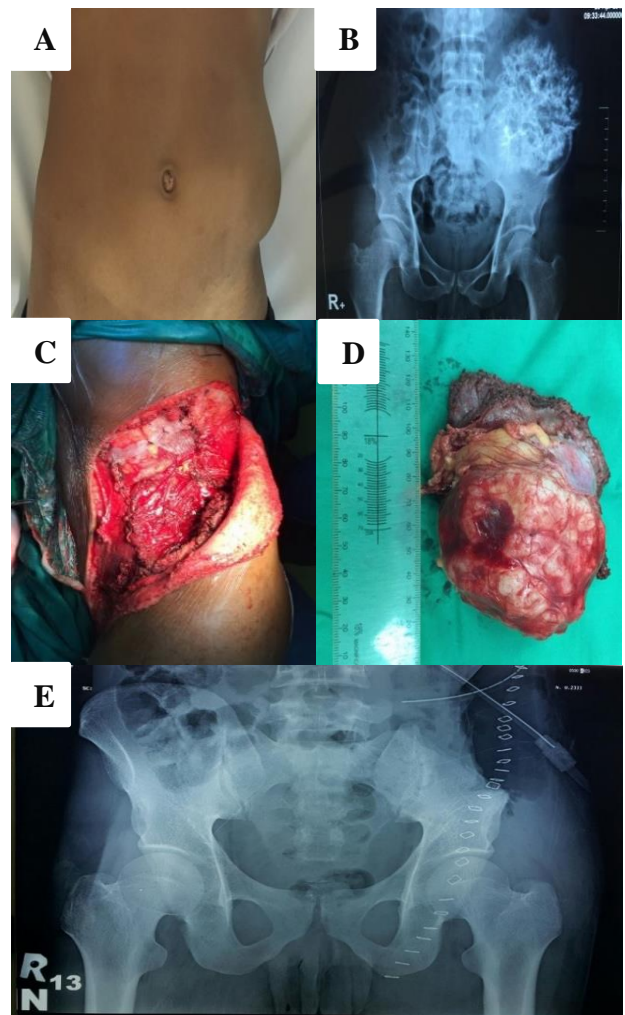
Limb-sparing internal hemipelvectomy, with reconstruction of the pelvis, is a standard treatment for malignant pelvic tumours, whenever wide resection margins can be achieved. Its advantages over amputation include preservation of the ability to walk and a decrease in the cosmetic and psychological side effects. Free vascularised fibular grafts (VFG) have been used to reconstruct pelvic and other large bony defects after resection of a tumour but these require considerable time and microsurgical expertise to perform. There is currently no conclusive evidence to suggest that they perform better in pelvic reconstruction than a non-vascularised fibular graft (NVFG). For reconstruction after excision of a tumour, the NVFG is a simpler, less time consuming technique than a VFG, and works well.<sup>5,6</sup>

**CASE REPORT**

First patient, male 28 y.o. complain painful lump on his left waist since 5 years ago. The size of the lump start at marble size, gradually increasing and become painfull. From x-ray and MRI showed mass size 11.2cm x 10.8cm x 9.2cm on left iliac wing extend to left sacroiliac joint. We done incisional biopsy and the result was chondrosarcoma. We performed wide excision of left iliac wing. Histopatology confirmed with chondrosarcoma grade I (Figure 1.)

Second patient, female, 47 y.o complain lump and pain on her right groin since 3 years ago. The lump gradually increasing in size. The mass gradually increased in size and painfull. There is no history of trauma, fever, chronic cough, or loss of weight. The x-ray and MRI revealed

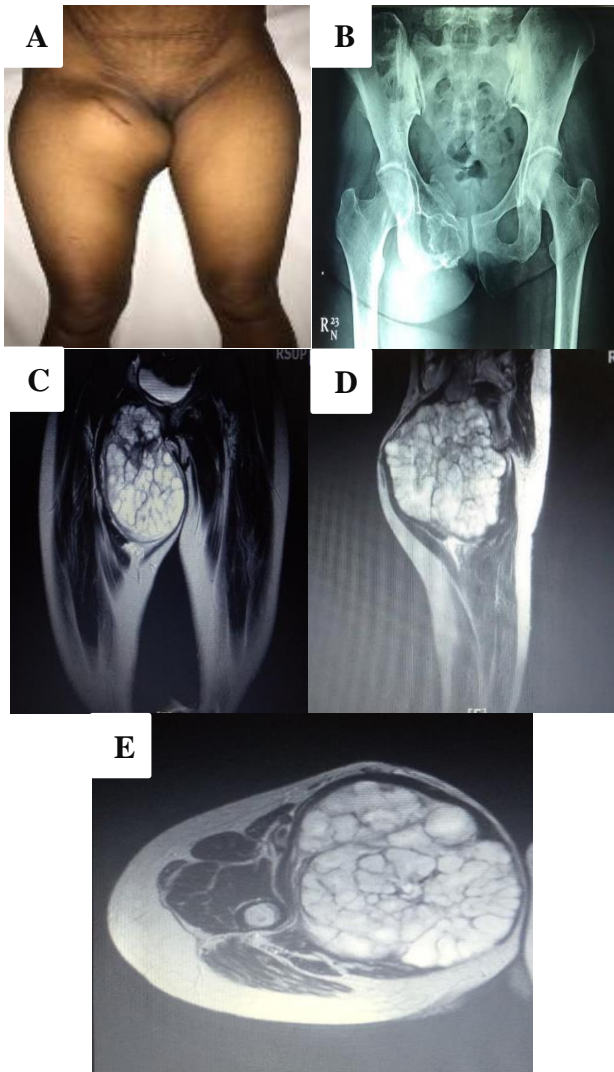
mass on right pubic rami 13.7cm x 11.5cm x 14.2cm with soft tissue mass around extended to medial part of proximal thigh. The result of inscisional biopsy was Chondrosarcoma. A wide excision of the tumor was performed, including removal of the right superior and inferior pubic rami. After that we use non-vascularized fibular graft to fill the defect and fixated with reconstruction plate. The anterior abdominal wall was supported with a synthetic mesh in order to prevent visceral herniation (Figure 2 and 3).



**Figure 1: A) Clinical picture mass on the left waist; B,C,D) X-ray and MRI revealed a mass sized 11.2cm x 10.8cm x 9.2cm on left iliac wing extend to left sacroiliac joint ; E) X-ray post operative.**

Third patient, pregnant women 22 y.o. (16weeks gestational age) complain pain and lump on her right groin since 1 year ago. The lump is gradually increasing in size. The x-ray and MRI revealed a mass sized 9.8cm x 11.4cmx13.0cm on right pubic rami extend to right acetabulum. The result of open biopsy was high grade chondrosarcoma. After that we performed internal hemipelvectomy through the right pubic rami and partially right acetabulum. Histopatology confirmed of chondrosarcoma grade IIB with clear margin of excision.

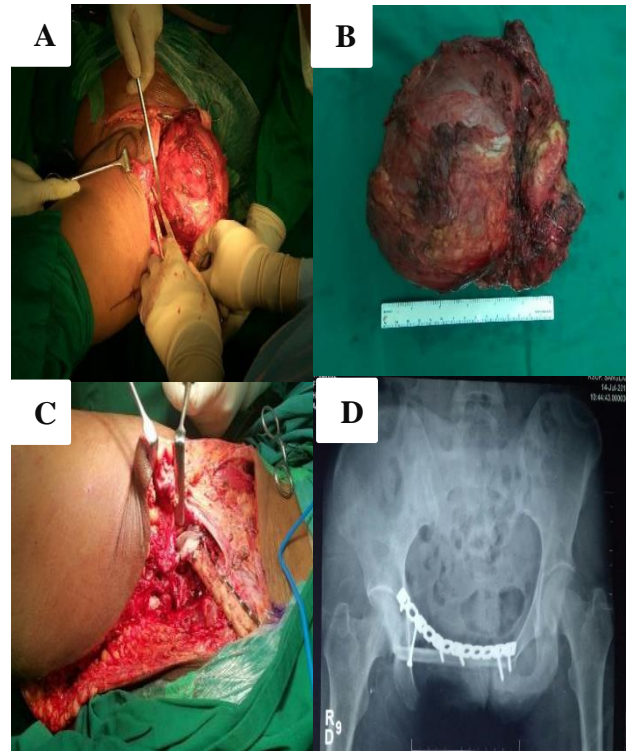
The patient delivered her baby in 38 week gestational age through sectio caesarian (Figure 4).



**Figure 2: A) Clinical picture mass on right groin extend to medial part of proximal thigh; B,C,D,E) X-ray and MRI revealed mass on right pubic rami 13.7cm x 11.5cm x 14.2cm with soft tissue mass around extended to medial part of proximal thigh.**

The first patient confirmed with the histopatology result with chondrosarcoma grade I. Second and third patient confirmed with the histopatology result with chondrosarcoma grade II. After 3 month post operatively, the first patient have no complain of pain, and can ambulatory full weight bearing with no crutches or walker. The second patient complain no pain, no urinary tract complain, and ambulatory partial weight bearing with crutches. The third patient also have no complain in urinary tract, pain free, and ambulatory with wheel chair during the pregnancy.

This patient had a wound dehiscence post operatively, but after debridement, the wound completely heal. And she already delivered her baby through sectio caesarian.



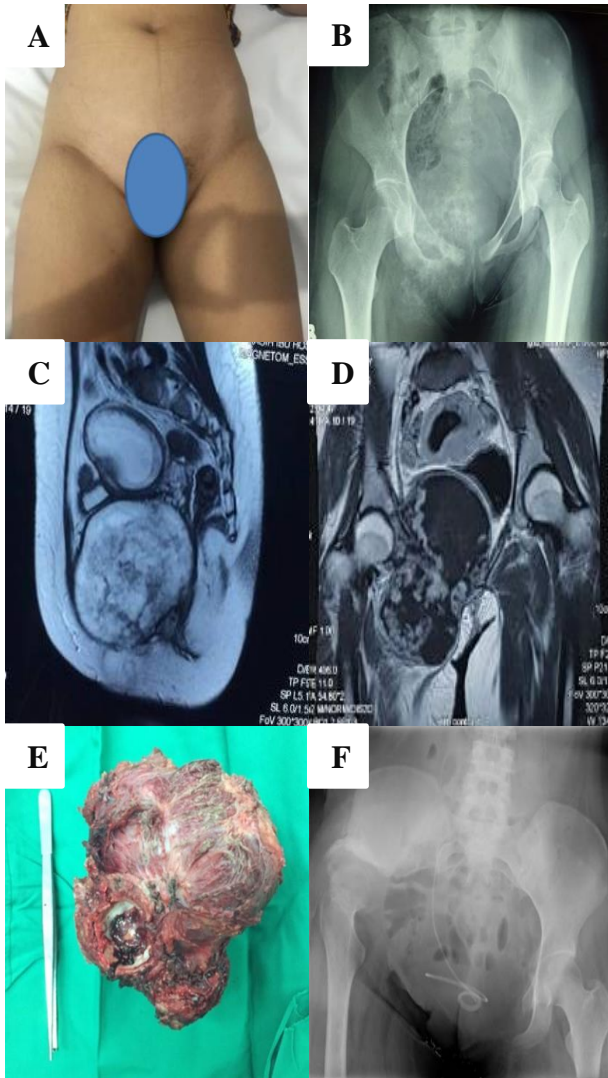
**Figure 3: A, B) Mass on the groin to medial part of proximal thigh and after wide excision; C) Clinical after NFVG; D) Pelvic X-ray post operatively.**

## DISCUSSION

Chondrosarcoma is the third most common primary bone malignancy after myeloma and osteosarcoma. More than 90% of the chondrosarcoma are idiopathic, which grow slowly, with less transfer and a relatively good prognosis. Accounting for approximately 20% of bone sarcomas and mainly affecting the middle-aged population. The primary chondrosarcoma usually happens to adults and elderly man aged between 40 and 70 years. Most of chondrosarcoma is found at pelvis (iliac bone involved most frequently), followed by proximal femur, proximal humerus, distal femur and ribs. Since chondrosarcomas are unresponsive to chemotherapy or radiotherapy, surgical resection was the only therapeutic solution for this patient. The tumor was large, which forced a wide excision in order to maintain free margins. The choice of surgical procedure constitutes a factor of paramount importance. The surgeon has to maintain a subtle balance between ensuring adequate resection margins and the risk of endangering adjacent vital structures as well as the structural stability of the pelvis.<sup>5,7</sup>

According to Enneking and Dunham the pelvis is divided into 4 zones. The ilium is assigned number I, the periacetabular area number II, zone III corresponds to the pubis and ischium and zone IV to the sacrum. The extent of the excision needed according to the pelvic tumor location defines the reconstruction procedure required in order to re-establish stability and functionality of the

pelvic ring. After zone III resection without impairment of the posterior structural elements a reconstruction of the anterior pelvic arch is not required, since pelvic stability is not affected. Therefore, in our case we focused on achieving adequate resection margins through the bone but also through the soft tissues.<sup>5,8</sup>



**Figure 4: A) Clinical picture mass on the right groin; B,C,D) X-ray and MRI revealed a mass sized 9.8cm x 11.4cm x 13.0cm on right pubic rami extend to right acetabulum ; E) The mass after wide excision; F) X-ray post operative.**

The indications for internal hemipelvectomy are usually stricter than those for hindquarter amputation. In particular, type I and I/IV resections usually require an intact sciatic notch. Perhaps because of this, internal hemipelvectomy also has a significantly better rate of survival than hindquarter amputation, provided a wide margin of resection can be achieved. The purpose of internal hemipelvectomy is to achieve local and systemic control of the disease, whilst preserving the leg and the ability to walk. There are eight subtypes of internal hemipelvectomy, each of which requires a different

method of reconstruction. These techniques may involve the use of prostheses, allografts, autoclaved grafts, autograft-containing tumour treated with liquid nitrogen and free fibular grafts, either vascularised or non-vascularised.<sup>9,10</sup>

## CONCLUSION

The case we report due to its location, size, tumour type and necessity of free margins for effective treatment represented a huge but interesting challenge for the surgical team. It also reinforces the need of a correct diagnosis and collaboration between specialities in the treatment of oncological patients.

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