CASE REPORT

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Left Hindquarter Amputation due to High-Grade Pleomorphic Sarcoma of the Groin: A Case Report

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ABSTRACT

Introduction: Hindquarter amputation or known as hemipelvectomy is a surgical technique that is primarily used for the eradication of malignant primary soft tissue and bone tumors of the pelvis, hip, and upper thigh regions. Occasionally, hindquarter amputation has been employed in the treatment of severe trauma, metastases, and infection. This case report aims to give a lesson in the case of the High-Grade Pleomorphic Sarcoma of the Groin because this is a very rare case and most patients are not willing to undergo amputation.

Case Presentation: A 54-year-old male patient came with a complaint of a lump in the thigh. Initially, the lump was as big as a marble and has been getting bigger since last year. The size of the lump was approximately 30 x 30 x 30 cm

Conclusions: The most common indications for amputation in patients with the primary localized disease were extensive involvement of the limb-girdle, multiple muscle compartment involvement, multifocality, and unsuitability for limb-sparing surgery, typically due to lack of a salvage option. Hindquarter amputation was used as a treatment for 13% of all pelvic bone sarcomas where there is a realistic chance of control of symptoms or long-term survival.

INTRODUCTION

Hindquarter amputation was first introduced by Gordon-Taylor and his associates in 1935 and subsequently modified by Banks & Coleman in 1956. Soft tissue sarcomas of the groin are a diverse group of neoplasms that arise in the connective tissues throughout the body [1]. They account for approximately 1% of adult malignancies and 7 to 15% of pediatric malignancies. About 50 to 60% of sarcomas occur in the extremities and are notorious for recurring and metastasizing despite apparently complete resection [2,3]. Approximately 40% of all sarcomas occur in people older than 55 years. The incidence rate in the general population is 1.4 per 100,000 but rises to 8 per 100,000 for people older than 80 years. The distribution of histologic types varies by age, in contrast to the biological behavior of carcinomas which depends on the site and the cell type of origin. Although some sarcomas are more aggressive than others, the specific histologic type appears to be of secondary importance in predicting biological behavior [4].

Due to the extremely mutilating nature of this operation, it is primarily used for the eradication of malignant primary soft tissue and bone tumors of the pelvis, hip, and upper thigh regions [5]. This technique is usually performed for malignant tumors located in the proximal higher near the level of the inguinal ligament or in the iliac fossa, or tumors infiltrating the wall of the lesser pelvis that are so extensive in terms of soft tissue and osseous involvement that they cannot be conservatively removed completely with preservation of the extremity. One of which is soft tissue sarcomas of the groin [1,6]. Any soft tissue mass on an extremity raises suspicion of malignancy, and any mass in the inguinal region must be differentiated from common entities such as inguinal or femoral hernia, adenopathy, abscess, or lipoma [6]. This case is interesting to discuss because soft tissue sarcomas of the groin may pose a difficult problem to the clinician both for diagnosis and management.

CASE PRESENTATION

We report the case of a 54-year-old male patient who came with a complaint of a lump in the thigh. Initially, the lump was as big as a marble and it's been getting bigger since last year (**Figure 1A**). On physical

examination, the lump was 30 x 30 x 30 cm (**Figure 1B**). The lump was painful and bled easily. There were no lumps in the other areas and no complaints of breath. The patient also complained about feeling full and nauseous with no vomiting, no history of radiation exposure, and no history of continuous exposure to sunlight for a long time. There is no family history of having suffered from the same complaint before. Based on the anamnesis, physical and supporting examination such as MRI and histopathology, the patient was diagnosed with high-grade pleomorphic sarcoma of a lower limb, including the hip (**Figure 1C, 1D**). The action performed for this patient is left hindquarter amputation.

The patient was in the semi-supine position under general anesthesia (**Figure 2A**). The Double J stent and urinary catheter were inserted. A colostomy was performed by a digestive surgeon to avoid fecal contamination during surgery. There are five main steps to perform this technique. First was the anterior retroperitoneal approach through the ilioinguinal incision to explore the extraperitoneal cavity, the abdominal wall is freed from the iliac crest from the pubic symphysis to the superior and posterior iliac spines (**Figure 2B**). The second major step was a perineal incision from the pubic symphysis to the ischial bone through the inferior pubic rami. The symphysis pubis is disarticulated. The bladder, ureter, and urethra are protected and preserved. The next step was posterior retro gluteal flap area exploration, which was performed by creating a fasciocutaneous or subcutaneous posterior flap that was mobilized along the iliotibial band and the greater trochanter to the sacroiliac joint (**Figure 2C**).

The fourth maneuver is detachment of pelvic floor musculature, performed with hips abducted and flexed. Lastly, the amputation is completed by the transection of the sacroiliac joint with a large osteotomy while retracting peritoneal content and preventing injury to the iliac vessels [2]. The operation was conducted within 7 hours. The limbs were brought by the patient's family, and taken partly for PA (**Figure 3C**). The patient was discharged 16 days after admission. The procedure was well tolerated, the patient's general condition and complaints are controlled, and the patient is allowed to be outpatient.

DISCUSSION

Hindquarter amputation or external hemipelvectomies were classified as an extension of the bone resection extended medial to the sacroiliac joint, to include the sacral ala, sacral or lumbar vertebrae, or the abdominal wall. Occasionally, hindquarter amputation has been employed in the treatment of severe trauma, metastases, and infection. One of which is soft tissue sarcomas of the groin [2,5].

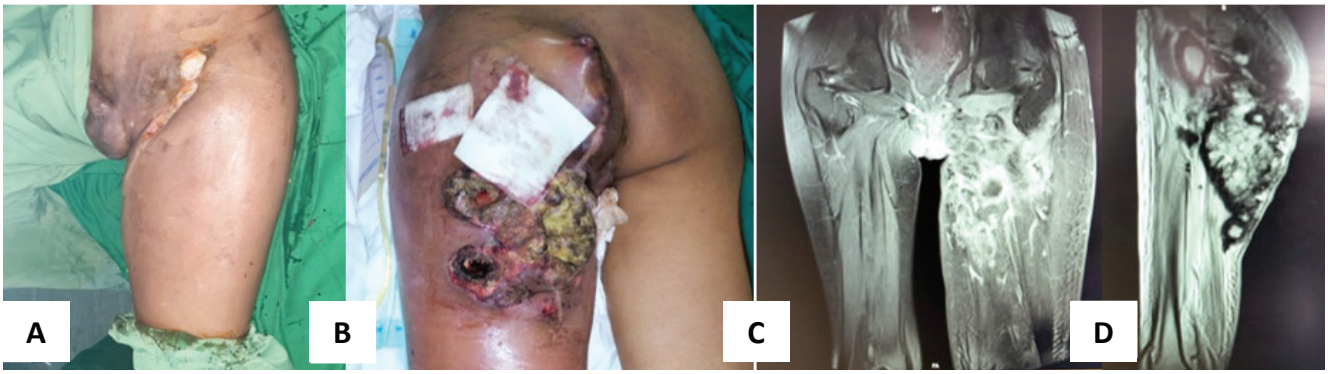

Figure 1. (A) Anterior pre-operation clinical appearance**;** (B) Posterior pre-operation clinical appearance; (C) Pelvic femoral MRI (posterior view); (D) Pelvic femoral MRI (lateral view)

Figure 2. (A) Semi-supine position; (B) Anterior retroperitoneal approach; (C) Posterior retrogluteal flap area exploration

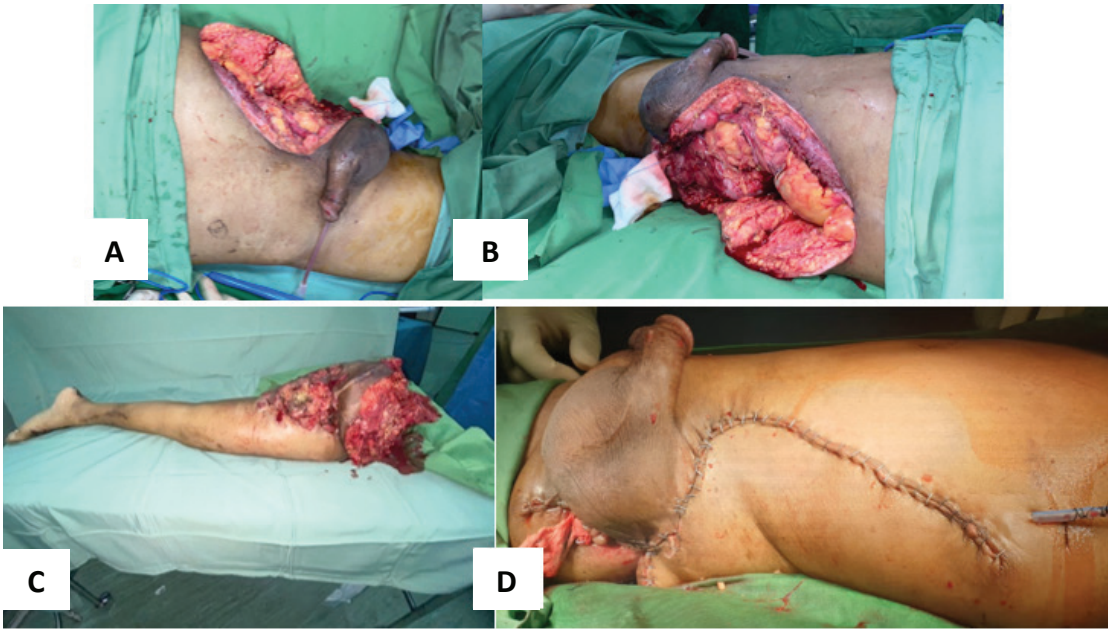

Figure 3. (A-B) post hindquarter amputation appearance; (C) transection of the sacroiliac joint with a large osteotomy; (D) post-operation clinical appearance.

Associated factors of sarcomas include genetic predisposition, exposure to radiation or chemical carcinogens, immunologic and viral factors, and environmental factors [7]. The majority of patients with sarcoma are with a painless mass, although 33% complain of pain, which may indicate a poor prognosis. In this case, the patient came with a complaint of a painful lump in the thigh. Of the patients who are in pain, about half of them eventually undergo amputation, and rapidly growing or aggressive tumor subtypes are more likely to be painful. Pain is often the first complaint in patients with malignant peripheral nerve tumors, which tend to spread along nerve bundles and are difficult to control. Unfortunately, a prolonged delay in diagnosis is common. Half of patients wait for months even years to seek treatment for the mass. These diagnoses should be considered only when there is a clear-cut history of trauma, and the physician should set a time limit of 6 to 8 weeks for observing the mass before treating it [8].

When evaluating a patient who has a potentially malignant mass, the physician should obtain at least four important elements of the history such as the duration of symptoms; a recent change in size or consistency of the mass; the constellation of symptoms (including pain, fever, or paresthesias); and an antecedent history of trauma or other environmental factors, such as irradiation to the field, etc. In this case, the patient came with a complaint of a progressive lump in the thigh. Whilst, there are six factors to assess in the physical examination including the location of the mass; its shape, size, consistency, and relation to surrounding tissues; and the state of the regional nodes. The nodes should be examined for metastasis even though the spread of sarcoma is almost always hematogenous. In this case, the lump was 30 x 30 x 30 cm, painful, and bled easily. There are no lumps in other areas and no complaints of breath. A biopsy should be performed on any soft tissue mass that is symptomatic or enlarging, any new mass that persists for more than weeks, or any soft tissue mass that is more than 5 cm in diameter [9].

Definitive treatment of a malignant lesion should be deferred until the results from the permanent sections and the results of an appropriate metastatic workup. A preoperative imaging study is indicated in all cases of sarcoma. Plain films are of limited overall value, whilst both computed tomography scan and MRI (Magnetic Resonance Imaging) are used. In general, MRI is considered superior for studying soft tissues. In this case, a contrast MRI scan of the T1 and T2 axial, coronal, and sagittal sections of the lower extremities was performed. A residual posteromedial mass to the left proximal femur was found, with attachments of the left ischium, left acetabulum, left proximal femur, and left m. semitendinosus, left m. semimembranosus, left m. gluteus maximus to medius, m. quadratus femoris, left m. adductor longus brevis, and left sciatic nerve infiltration [9]. Surgery is the mainstay of treatment for soft tissue sarcomas, and surgical interventions have spanned the spectrum from simple wide local excision to radical amputation. Early attempts at the limited resection of these tumors resulted in uniformly poor results because of local recurrence, so radical amputation became the accepted surgical treatment [10].

The action performed for this patient is hindquarter amputation of the left lower extremity. The most common indications for amputation in patients with the primary localized disease were extensive involvement of the limb-girdle, multiple muscle compartment involvement, multifocality, and unsuitability for limb-sparing surgery, typically due to lack of a salvage option. Indications were similar for recurrent localized disease.

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Tumor size was significantly larger for patients undergoing primary amputation compared with those with recurrent disease. In the recurrent disease group, 100% had undergone prior surgery in the tumor bed, 75% were previously treated with local external-beam radiotherapy (EBRT), and 25% had already received isolated limb perfusion, decreasing the potential for further limb salvage. In contrast, for patients with metastatic disease, palliative amputation was performed for very different indications: fungating lesions, intractable pain, and pathologic fracture [10].

Hindquarter amputation was used as a treatment for 13% of all pelvic bone sarcomas. In this case, embolization was performed to control the major vessels early in the operation. Local recurrence arose in 15% of our patients, which is similar to that reported by O'Connor. This is less than half the rate of 31% reported following pelvic endoprosthetic replacement and considerably less than the 45% reported following pelvic resection for primary sarcomas [4,11]. Based on a study conducted by Kiiski et al. [12] in 2020 on patients who underwent hindquarter amputation between 1996 and 2018 in a single tertiary referral center for sarcoma, in carefully selected patients, hindquarter amputation is associated with satisfactory survival, with a low risk of perioperative mortality.

During post-operation, a follow-up action was conducted. The patient no longer complained of pain and there was no recurrent anemia so the patient was discharged and never came again for a follow-up. The high risk of local recurrence following limb salvage for pelvic tumors highlights the conflict between the morbidity of a hindquarter amputation and the perceived functional benefits and improved quality of life after limb salvage for pelvic sarcomas. However, there is no doubt that hindquarter amputation remains a significant surgical exercise with a prolonged recovery, both physical and psychological for the patient. To improve patients' long-term survival rates, adjuvant chemotherapy is now routinely employed in treating certain malignant tumors, such as osteogenic sarcoma, Ewing's sarcoma, embryonal rhabdomyosarcoma, etc. Furthermore, in addition to surgery, radiotherapy, and chemotherapy; it's believed that immunotherapy effectiveness has been unequivocally proven [5,7,13].

CONCLUSIONS

Soft tissue sarcomas of the tight are a diverse group of neoplasms that arise in the connective tissues throughout the body. The most common indications for amputation in patients with the primary localized disease were extensive involvement of the limb-girdle, multiple muscle compartment involvement, multifocality, and unsuitability for limb-sparing surgery, typically due to lack of a salvage option. Hindquarter amputation was used as a treatment for 13% of all pelvic bone sarcomas where there is a realistic chance of control of symptoms or long-term survival.

DECLARATIONS

Competing of Interest

The authors declare no competing interest in this study.

Acknowledgment

Not applicable

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