



Original Article

Is hip disarticulation for bone and soft tissue sarcomas still justified in modern era of treatment?

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Abstract

Background: Hip disarticulation is the radical amputation of the lower limb through the hip joint. Hip disarticulation is a treatment modality tumours with neurovascular encasement and non-responsive to chemotherapy.

Patients & Methods: The study included 38 retrospective cases of patients who were operated in our institute with hip disarticulation for bone and soft tissue sarcoma from 2013 to 2018. Patients were analysed by tumour type, extent of disease and intent of surgical intervention (curative, curative/palliative, palliative). Disease free survival (DFS) and post-operative overall survival (OS) were calculated from the time of surgery to the last follow-up or date of death.

Results: The median DFS for all patients was 12 months, the median OS was 17 months and one year survival rate was 63.88%. When this manuscript was drafted, only 42% of the patients in the sample were alive.

Conclusion: Hip disarticulation is a major surgical procedure and proper planning is required. Hip disarticulation will continue to feature in the sarcoma surgeon's armamentarium for unresectable tumours.

Keywords: Hip disarticulation, bone sarcoma, soft tissue sarcoma, survival rate.

Introduction

Recent advances in imaging techniques, medical oncology and surgical oncology has resulted in limb salvage for malignant tumors of lower limb.^[1-5] Despite this fact, amputation is still needed where the limb salvage is not feasible due to involvement of critical structures such as the neurovascular bundle i.e. femoral vessels, sciatic nerve and inability to provide soft tissue coverage.^[2-4] Displaced pathological fracture of the proximal femur due to malignant bone tumors

required amputaation due to soft tissue contamination^[6]. Hip disarticulation is the radical amputation of the lower limb through the hip joint. Hip disarticulation is a treatment modality tumours with neurovascular encasement and non-responsive to chemotherapy. Hip disarticulations accounts for <1 % of lower limb amputations. In current study we have analyzed the local control, survival and function in patients in whom hip disarticulation was performed.

Patients & Methods

This is a retrospective study of 38 patients who were operated in our institute with hip disarticulation for bone and soft tissue sarcoma from 2013 to 2017. Clinical and pathologic variables were gathered through retrospective review of medical records. Patients were analyzed by tumour type, extent of disease and intent of surgical intervention (curative, curative/palliative, palliative). Patients in the curative group presented with extensive tumours involving thigh or advanced regional disease without debilitating symptoms. Patients in the curative/palliative group had regional disease causing intractable pain, loss of limb function due to pathological fracture and/or neurovascular compromise and fungating wounds without evidence of systemic metastases. Lastly, those in the palliative group presented with known metastatic disease; however, each patient suffered from intractable pain, loss of function, and/or fungating wounds that could not be controlled by conservative measures. Postoperative complications were studied. Recorded data was updated through March 2018. Disease free survival (DFS) and postoperative overall survival (OS) were calculated from the time of surgery to the last follow-up or date of death.

Results

Of the 38 patients analyzed, there were 26 males and 12 females, median age at the time of surgery was 34 years (range 11-70 years). The primary diagnoses included 26 bone sarcomas (18 Osteosarcoma, 6 Ewing's sarcoma, 2 Chondrosarcoma) and 12 soft tissue sarcomas (6 Undifferentiated Pleomorphic Sarcoma, 2 Liposarcoma, 2 Leiomyosarcoma, 2 Synovialsarcoma, 2 Rhabdomyosarcoma). Regarding the extent of disease, 30 of patients presented with primary tumors of the proximal extremity, 8 with regional recurrence in the groin or proximal extremity. Amongst the primary cases, 8 had metastatic disease on presentation. (Table 1)

Table 1 Distribution of Clinicopathologic Characteristics of 38 Patients Undergoing Hip Disarticulation

	Numbers (Percentage)
No of Patients	38
Age, median (Range)	34 (11-70)
Sex	
Male	26 (68)
Female	12 (32)
Tumor Type	
Bone sarcoma	26 (68)
Soft tissue sarcoma	12 (32)
Type of Disease	
Primary,	30 (79)
Metastatic at presentation	8
Regional Recurrence	8 (21)

Clinical Presentation

Upon presentation, 12 patients had fungating wounds due to tumour infiltration through the skin, 30 patients had intractable pain that was poorly managed with standard medications and 16 patients had a dysfunctional limb with pathological fracture and due to neural and/or vascular compromise.

Neoadjuvant Chemoradiation

Neoadjuvant therapy was used in 36 patients: 28 patients received chemotherapy and 8 patients underwent radiation therapy prior to surgery.

Surgical Resection

Surgery was performed with curative intent in four patients, with curative/palliative intent in 26 patients and for palliation alone in 8 patients (Table 2).

Table 2 Therapeutic Intent for Patients Hip Disarticulation

	Numbers (Percentage)
No of Patients	38
Curative	4 (11)
Curative/ Palliative	26 (68)
Fungating Wound	10
Intractable Pain	23
Dysfunctional limb	14
Palliative	8 (21)
Fungating Wound	2
Intractable Pain	7
Dysfunctional limb	2

Surgical Complications

The median postoperative follow-up was 15 months (range, 6-33). Wound complications including cellulitis, abscess and flap necrosis occurred in 21% (8 of 38) of patients. Five patients required operative debridement of their surgical wound for infection or flap necrosis. Notably, three of the five patients requiring surgical debridement initially presented with fungating wounds, putting them at increased risk for surgical site infection. Ultimately, all patients who presented with fungating wounds achieved complete surgical wound healing.

Postoperative Outcomes and Survival

Intractable pain was a presenting symptom in 79% (30 of 38) of the patients. Of these 30 patients, postoperative pain could be controlled with oral pain medications in 80% (24 of 30) following surgery.

Phantom Pain

Phantom pain is a common phenomenon described after extremity amputation. We included phantom pain in our analysis of postoperative complications. The overall incidence of phantom pain in 38 evaluable patients undergoing disarticulation was 60%. The majority of these cases were effectively managed by a dedicated pain/palliative care service.

Oncological outcomes

Five patients developed local recurrence after the amputation, three with soft tissue sarcomas and two with bone sarcomas. It was more common when the amputation had been done for local recurrence than when it was done as a primary procedure and was more common when the margins of excision were close. All of the patients who developed local recurrence were found to have metastases at the time of or prior to the local recurrence becoming apparent; they were treated with palliative care with a mean survival of 4 months.

The median DFS for all patients was 12 months, the median OS was 17 months and one year survival rate was 63.88%. When this manuscript was drafted, only 42% of the patients in the sample were alive.

Function

Although all patients were referred to an artificial limb centre and most were provided with prosthesis, only one of the surviving patients used it regularly, the others only using it occasionally. The main problems with the limb were its weight and its inconvenience when going to the toilet.

Discussion

Hip disarticulation of the hip is major amputation of lower limb involves resection of lower limb from hip joint. This procedure leads to loss of fulcrum and there is difficulty in ambulation of patients. Due to significant morbidity of hip disarticulation leads to loss of self esteem, function and mobility and phantom pain sensation. Hip disarticulation for vascular ischemia is having poor outcome and has around 40-45 perioperative mortality.^[7]

The indication for hip disarticulation are extensive size of tumor and its minimal response to neoadjuvant therapy. These patients are at higher risk of metastatic disease and leads to higher local recurrence and poor oncological outcomes.. Jain et al studied 80 patients with hip disarticulation in maximum patients of osteosarcoma followed by chondrosarcoma as a primary procedure and due to local recurrence.^[8]The 5 year survival rate for patients with primary hip disarticulation was 32 % and local recurrence was seen 25% cases.

Phantom limb pain, difficulty in ambulation and difficulty in wearing prosthetics is observed following hip disarticulation.

The few studies that analyze functional results after hip disarticulation demonstrated that patients present poor quality of life and significant difficulties in the recovery of the gait and in the use of substitution prosthesis for the lower limb.^{[8,}

^{9, 10]} The energy expenditure for gait in patients

undergoing hip disarticulation increases by 80-90 % and leads to wheel chair mobilization. Nowroozi et al analyzed gait in hip disarticulation with prosthetic limb leading to a higher energy consumption when compared with gait with crutches.^[11] Majority of patients in current study most of the survivors walk with crutches without the use of the prosthetic limb, while only one can use the prosthesis.

The limitations of the present study were the small number of individuals in the sample and the fact that it was a retrospective observational study. So a multicenter study with a comparison group would be recommended for future studies.

Conclusion

Hip disarticulation is a major surgical procedure and proper planning is required. Hip disarticulation will continue to feature in the sarcoma surgeon's armamentarium for unresectable tumours. At experienced centres, major amputations can be performed safely with acceptable morbidity and low mortality rates. Palliation of complex wounds and disabling pain can improve quality of life.

Declarations

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Conflict of interest: no

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