Case Series

Management of locally advanced soft tissue tumors with major vessel reconstruction - A case series

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Abstract

Management of soft tissue tumors in the advanced stage often precludes complete surgical resection in view of major vessel involvement and demands major amputation for tumor clearance. We present a series of patients presented with advanced tumor presentation by major vessel resection and reconstruction (using vein or synthetic graft) without compromising tumor clearance. This preserves the limb function without increasing the tumor recurrence rate.

Keywords: Soft tissue tumor, Major amputation, vessel reconstruction, tumor clearance, synthetic graft & vein graft.

Introduction

Surgical resection of soft tissue tumors without compromising the oncological principles remains a challenge over the years for vessel infiltrated lesions. We have done major vessel reconstructions for three such tumors with vessel encasements over a period of one year in our institute. Major amputations were avoided in all six cases with complete tumor resection preserving limb function.

Aim and objectives

To present a single center experience in the management of advanced soft tissue tumors with vessel infiltration with the intent of preserving limb function without compromising oncological principles.

Type of Study

Retrospective study.

Inclusion criteria

Soft tissue tumors with vessel involvement

Exclusion criteria

Presence of distant metastasis

Bone tumors and solid organ tumors.

Sample size

6

Methods and Materials

We have done soft tissue tumor resection with major vessel reconstruction on 6 patients at our tertiary care hospital, saveetha medical college, Thandalam between June 2020 and May 2021. Five patients presented with extremity soft tissue tumors and one patient presented with pelvic soft tissue tumor. All six patients were done with vessel reconstruction using reversed saphenous vein graft or Synthetic Dacron/PTFE graft. Post operative period was uneventful and patients were mobilised from post operative day 5 onwards. One patient developed lung metastasis during follow-up period otherwise the limb remained functionally viable.

Case 1

A 48yr/male presented with soft tissue sarcoma of left thigh with the involvement of femoral vessels otherwise preserved limb function. After complete evaluation, he was planned for tumor resection with femoral artery and vein reconstruction[1-3].

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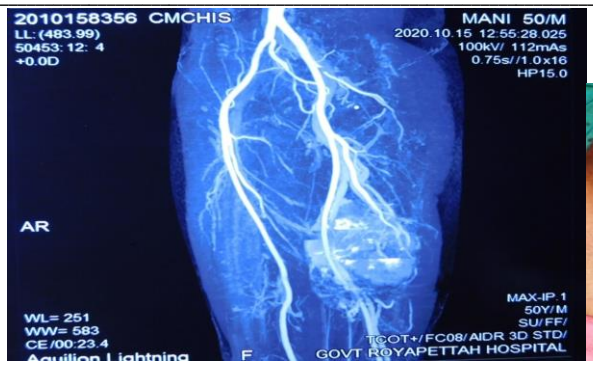


Fig.1: CT angio of the left thigh showing tumor infiltration of femoral artery and vein

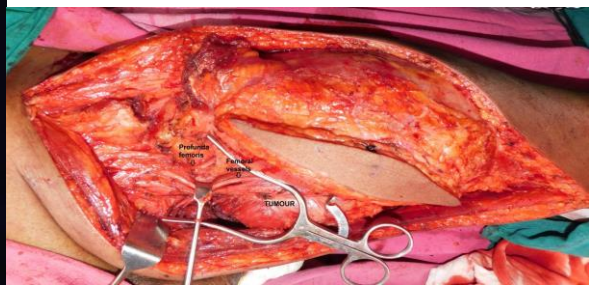
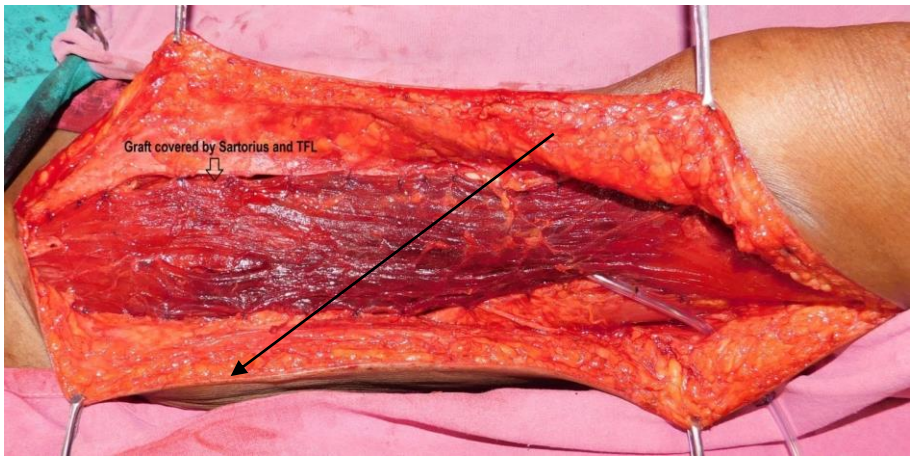


Fig.2: Perop image showing the tumor encasing femoral arteries and veins.

Fig 3: Image showing the resected tumor bed with clamps on the artery and veins.

Fig 4: Femoral vessels (both artery and vein) were reconstructed using a synthetic Dacron graft.



Synthetic graft

Fig 5: Graft covered with Sartorius muscle flap to prevent dessication

Case 2

A 16 yr female presented with a pelvic soft tissue tumor infiltrating the left iliac vessels with palpable left leg pulse and Doppler screening showed no DVT left leg. After evaluation, she was planned for tumor resection with iliac vessel reconstruction.

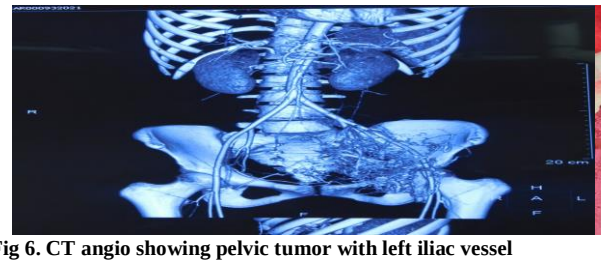


Fig 6. CT angio showing pelvic tumor with left iliac vessel involvement.

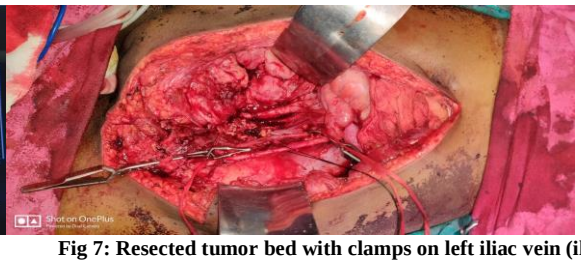


Fig 7: Resected tumor bed with clamps on left iliac vein (iliac artery dissected free of the tumor and preserved)

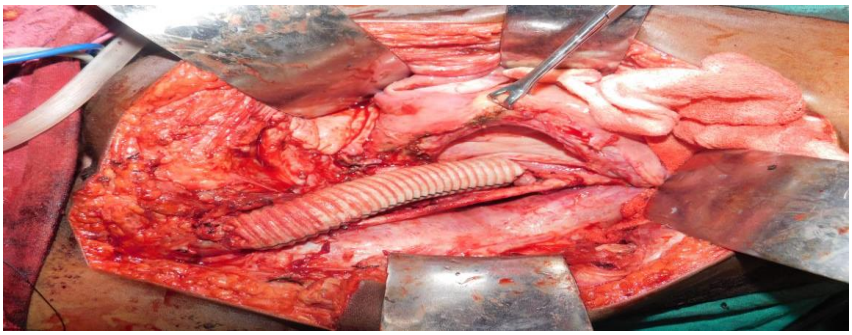


Fig 8.Left iliac vein reconstructed using Dacron graft 16mm diameter.

Case 3

A 21 yr/female presented with soft tissue tumor of the right humerus with encasement of nerves, brachial artery, brachial vein, and basilic vein.. After complete evaluation, she was planned for tumor resection with brachial vessel reconstruction.

Fig 9. Brachial artery and vein reconstructed using reversed saphenous vein graft. Median and musculocutaneous nerves repaired.

Fig 10. Grafts were covered with biceps and coracobrachialis to prevent graft dessication.

Case 4

A 42yr/male presented with the complaints of right arm osteosarcoma with Brachial vessels infiltration without distant metastasis. Patient was operated with tumor resection and reconstruction of brachial vessels with reversed great saphenous vein graft. Patient had uneventful postoperative recovery. Limb functionality preserved.

Case 5

A 35yr/male presented with locally advanced tumor of left knee, on evaluation he was diagnosed to have soft tissue sarcoma of left knee with popliteal vessels and tibial nerve encasement with mild sensory and motor weakness. Patient was operated with tumor resection with popliteal vessels reconstruction using synthetic PTFE graft, nerve reconstruction accomplished by plastic surgery team. Patient had preserved limb with minimal functional compromise.

Case 6

A 50 yr/female presented with painless mass over left lower abdominal wall, on evaluation she was diagnosed to have Desmoid tumor with femoral artery infiltration. Imaging revealed no distant metastasis. Patient was operated with tumor resection with femoral artery reconstruction using synthetic PTFE graft. Patient was left with functionally viable limb.

Results

In this retrospective study on three patients, we have done major vessel reconstruction as a part of tumor resection with the intent to preserve limb functionality, we reconstructed 2 arteries and 3 veins in a short span of time between June 2020 and May 2021. All three patients were left with a functionally viable limbs with complete tumor resection with less or no morbidity in the post-operative period except one patient with pelvic tumor who developed lung metastasis[6] during the follow-up period. Combined reconstruction of artery and vein[5] reduced the venous hypertension, avoiding the need for fasciotomy and prolonged hospitalization. Screening Doppler at 1 month and 3 month interval showed no thrombosis of the graft.

Discussion

In our institute, Royapettah Government Medical College Hospital, Chennai, a tertiary care center for tumor management, referrals of patients with locally advanced malignancies and advanced malignancies are relatively substantial in number, often these patients were advised for major amputations from peripheral hospitals in view of lack of facilities and surgical expertise[1,2,3]. We operated on three such patients with soft tissue tumors encasing major vessels in one year duration from June 2020 to May 2021. Though the incidence of pelvic soft tissue tumor is less, it often presents in an advanced form due to its anatomical location and often infiltrates vessels presenting a challenge for tumor clearance. We operated on one such patient as shown in Fig 8. With the preservation of the iliac artery with tumor clearance and replaced the iliac vein[6] with Dacron graft in view of dense tumor adherence. Extremity soft tissue tumors

usually manifest early with a very rare incidence of major vessel incorporation, we operated on five such patients, one with the thigh sarcoma infiltrating the femoral vessels[4,5], second patient with lower abdominal wall tumor infiltrating femoral artery , third patient with tumor infiltrating popliteal vessels and the other two patients with the arm sarcoma with brachial vessels[7] encasement. All the patients were done tumor resection with the reconstruction of the artery with / without vein (using Dacron/PTFE grafts for femoral and popliteal vessels Reversed saphenous vein graft for brachial vessels to overcome the size discrepancy and avoid prolonged anesthesia /surgery duration)[4]. To avoid graft dessication and bleeding complications, the grafts were covered with muscles (sartorius for thigh tumor and biceps for arm tumor). All Six patients had no major morbidity or wound complications, except the pelvic sarcoma patient, she developed lung metastasis during follow-up period. All these patients were ambulant with a functionally viable limbs.

Conclusion

Soft tissue tumors presenting with major vessel involvement are although a less frequent condition but precludes tumor resection without major vessel reconstruction. We, at our tertiary care center, have replaced major vessels using synthetic Dacron/PTFE and saphenous vein grafts with the intent to remove the tumor with adequate clearance and preserved limb functionality. Thus, major vessel reconstruction preserves limb function for tumors, which otherwise precludes operability or demands major amputation.

Conflict of Interest: Nil Source of support: Nil

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