



Original Article

Amputation risk after the revascularization procedures in sarcoma resections[☆]



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ARTICLE INFO

Article history:

Received 2 May 2016

Accepted 30 August 2016

Available online 21 October 2017

Keywords:

Soft tissue sarcoma

Osteosarcoma

Limb salvage

Amputation

Reconstructive surgical procedures

ABSTRACT

Objective: The objective of this study is to evaluate the efficacy of vascular reconstructive surgery after resection of bone and soft tissue tumors in extremities and the risk of progression to amputation.

Methods: This is a retrospective, observational data collection from medical records of patients who underwent resection of bone and soft tissue tumors in the period of 2002–2015. Thirteen patients met the inclusion criteria, which evaluated the correlations between certain factors (gender, tumor type, location, reconstruction, revascularization and patency, infection) with amputation in the postoperative period.

Results: In this study, of the 13 patients undergoing reconstruction, five (38.46%) evolved to amputation. All patients who progressed to amputation had the following in common: presence of bone sarcoma ($p=0.005$), having undergone reconstruction with an orthopedic prosthesis ($p=0.005$), lack of vascular patency in the revascularization site in the postoperative period ($p=0.032$), and surgical site infection ($p=0.001$). None of the patients with soft tissue sarcoma underwent amputation, and the only patient with bone sarcoma who did not undergo amputation had no infection and maintained vascular patency of the graft.

Conclusion: The occurrence of infection appears to be one of the main risk factors for failure of revascularization, especially in cases of bone sarcoma in which vascular reconstruction is performed with placement of a non-conventional joint prosthesis.

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[☆] Study conducted at Hospital Madre Teresa, Serviço de Ortopedia Oncológica; and Universidade Federal de Minas Gerais, Hospital das Clínicas, Belo Horizonte, MG, Brazil.

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<http://dx.doi.org/10.1016/j.rboe.2017.10.005>

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Risco de amputação após procedimento de revascularização nas ressecções de sarcoma

R E S U M O

Palavras-chave:

Sarcoma de tecidos moles
Osteossarcoma
Salvamento de membro
Amputação
Procedimentos cirúrgicos
reconstrutivos

Objetivo: O objetivo deste estudo é avaliar a eficácia da cirurgia de reconstrução vascular após ressecção de tumores ósseos e tecidos moles em extremidades e o risco de evolução para amputação.

Métodos: Estudo retrospectivo, observacional, de coleta de dados em prontuário médico de pacientes submetidos a ressecção de tumores ósseos e de tecidos moles de 2002 a 2015; 13 pacientes preencheram o critério de inclusão, foram avaliadas as correlações de determinados fatores (gênero, tipo de tumor, localização, reconstrução, revascularização e patência, infecção) com amputação no pós-operatório.

Resultados: No presente estudo, dos 13 pacientes submetidos à reconstrução, cinco (38,46%) evoluíram com amputação. Todos os pacientes que evoluíram com amputação tinham em comum o fato de ser portadores de sarcoma ósseo ($p=0,005$), ter sido submetidos a reconstrução com prótese ortopédica ($p=0,005$) e não apresentar patência vascular no local da revascularização no período pós-operatório ($p=0,032$), além de apresentar infecção no local da cirurgia ($p=0,001$). Nenhum dos pacientes portadores de sarcoma de partes moles foi submetido à amputação e o único paciente do grupo com sarcoma ósseo que não sofreu amputação não apresentava infecção e mantinha patência vascular no enxerto.

Conclusão: A ocorrência de infecção parece ser um dos principais fatores de risco para a falência da revascularização, especialmente nos casos de sarcoma ósseo em que a reconstrução vascular é feita juntamente com colocação de próteses articulares não convencionais.

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Introduction

Primary malignant tumors of the musculoskeletal system are rare, accounting for 1% of all types of cancer¹⁻⁹; surgery is the primary method of treatment. Currently, limb preservation is possible in 80% of cases. A few decades ago, involvement of large vessels by tumors was an indication for amputation.^{1,2,7,10,11} However, with the improvement of imaging techniques and adjuvant treatment, it has become possible to use vascular reconstruction techniques without harm regarding relapse or metastatic dissemination of the disease, which increases the limb preservation rate without compromising survival or recurrence of the disease.^{2,8-10}

Vascular reconstruction in patients undergoing surgery for resection of sarcomas has proven to be a viable method in limb salvage procedures; autologous grafts or vascular prostheses made of synthetic materials, such as polytetrafluoroethylene (PTFE), can be used.^{1,3-9,11,12}

Umezawa et al.¹ assessed 23 patients with bone or soft tissue tumors in the lower limbs who underwent extensive resections with vascular structure resection; total amputation was avoided in all patients. Emori et al.³ evaluated patients with soft tissue sarcomas located in the inguinal region who underwent tumor resection and required vascular reconstruction; in nine of the ten patients in their study, preservation of the affected limb was possible. Other authors have shown good results of vascular reconstruction as a limb salvage technique.^{4,6,8}

Based on these data, this study aimed to assess the risk of amputation after arterial reconstruction in bone and soft tissue sarcomas at the extremities, and the factors associated with failure of the salvage procedure.

Material and methods

This is a retrospective, observational study of data collection in medical records of patients who underwent bone and soft tissue tumor resection from 2002 to 2015.

The study included patients who, during tumor resection, required intervention by the vascular surgery team for a vascular reconstruction procedure; the procedure was indicated prior to or during surgery. Patients in whom the vascular procedure did not require reconstruction (such as arteriorrhaphy), those with incomplete data in the medical record, those with less than six months of follow-up, and those who did not agree to participate were excluded from the study.

The studied variables were:

1. Age
2. Gender
3. Reconstruction level (iliofemoral, femoropopliteal, popliteal tibial, brachial)
4. Type of tumor (bone, soft tissue)
5. Type of reconstruction (prosthesis, graft)
6. Postoperative infection
7. Prior chemotherapy or radiation therapy
8. Location of the tumor

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