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Case Report
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Necessity of Preoperatıve Embolizatıon in a Case of Renal Cell Carcınoma with Bone Metastasis for Whom Megaprosthesıs is Applied

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Abstract

Because bone metastases lead to pain, reduced mobility and pathological fractures, they have a risk of morbidity and mortality. Solitary bone metastases are treated with radiotherapy but some treatment with surgical removal of the lesion. Blood loss encountered during surgical intervention which will be performed in metastatic bone tumours is a situation which is commonly seen and leads to fatal events. It is more likely to encounter especially in tumours which exhibit osteolytic activity and has good vasculature, like renal cell carcinoma. Significance of bleeding control in our case who was operated from his humerus due to renal cell carcinoma and for whom total humerus replacement was performed was tried to be explained together with the literature.

Keywords: Carcinoma; Bone metastasis; Bleeding

Introduction

Renal cell carcinoma (RCC) accounts for 90% of primary malignant renal parenchymal tumours [1]. It occurs in advanced ages and has a male predominance [2]. It has a potential for causing early metastasis, bone involvements is the second most common site of distant metastasis, following pulmonary involvement [3]. Bone metastasis causes pain, reduced mobility and pathological fractures in patients and distresses socio-cultural life of the patient [4]. Beside the palliative treatments which can be applied in treatment of these metastases, the primary treatment is surgery. It has been proven by the studies conducted that surgical excision of such type of solitary metastases, particularly the pulmonary and bone metastases, influences the lifespan positively [5]. In order to limit intraoperative bleeding before surgical treatment of such type of tumours that have high bleeding potential, application of an embolization in metastatic bone lesions reduces bleeding, as well as postoperative bleeding [6].

In this study, a case who previously underwent for nephrectomy due to diagnosis of RCC, developed metastasis in diaphysial part of the left humerus 2 years after the nephrectomy and for whom total humerus replacement was performed, with application of embolization for tumoral tissues is represented, the literature has been reviewed.

Case Presentation

In a seventy year-old male patient, in November 2013 he was operated due to pre-diagnosis of a renal tumour and left-sided radical nephrectomy was performed. The patient who had a pathology result indicating renal cell carcinoma in left kidney admitted to outpatient clinic of Department of Orthopaedics and Traumatology with complaint of pain in left humerus 1 year after the operation. In left arm x-ray decided to be obtained following an orthopaedic evaluation, a pathological fracture and osteolytic lesion were recognized in distal 1/3 part of left humerus, metastasis was primarily considered due to the history of RCC surgery (Figure 1). The case underwent for radiological examinations for the left arm. In the MRI examination performed, an expansile mass lesion with dimensions of 4x2.7x1 cm at the level of mid-1/3 distal part of left humerus which was localized in medullary region, destructed the cortex circumferentially, was heterogeneous in T1 images, hyperintense in T2 images, had intense contrast uptake and exhibited pathological vascularisation was recognized (Figure 2). In whole body scintigraphy, focally increased uptake with marked malignant features was observed in 1/3 distal part of diaphysis of left humerus (Figure 1). In the patient in whom no metastasis was detected in any other bony structures, under general anaesthesia, the mass was accessed via an incision made from lateral to the fracture line, after the material was

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Figure 1: Humoral involvement in the destruction area and scintigraphy of the patient in the direct AP and lateral radiographs before surgery.

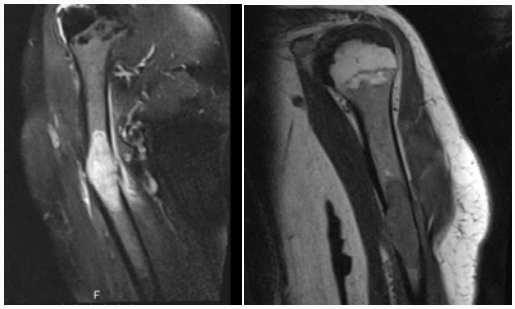

Figure 2: The patient has MRI T1 and T2 lesion defects.

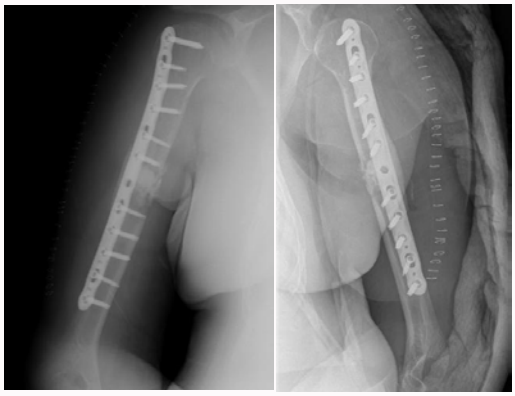

Figure 3: Filling the defect with plaque screw and cement in the first operation of the patient.

obtained for pathology the tumoral tissue was cleared, prophylaxis was performed by using 1 bone cement for the longest humeral plate and remaining defective area and then the operation was concluded (Figure 3). For the patient for whom no embolization was performed before the procedure, 7 units of blood transfusion become necessary due to diffuse intraoperative bleeding of the tumour and for normal hemodynamics postoperatively. A significant reduction of the pain of the patient was observed approximately two days after the procedure. Later, the patient was applied radiotherapy. Further radiological work-ups were performed due to emerged pain occurred 2 years after the first operation in left arm of the patient who did not have any problems during his follow-ups. It was recognized in his performed work-ups that reactivation had occurred in the tumour, osteolytic areas were formed throughout the humerus and pathological fracture developed in ipsilateral elbow (Figure 4). The patient who had severe pains in his upper ekstremity and loss of function was informed about risks concerning the operation and reconstruction

Figure 4: Two years after the first operation of the patient, lytic areas and pathologic fractures are seen in the elbow and total humerus.

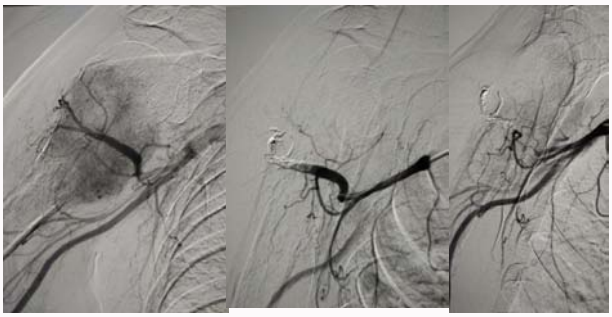

Figure 5: The circiumflexartery and other small branches feeding the tumoral tissues in the humeral region were embolized.

Figure 6: The second operation of the patient shows lytic areas in the inferior humerus.

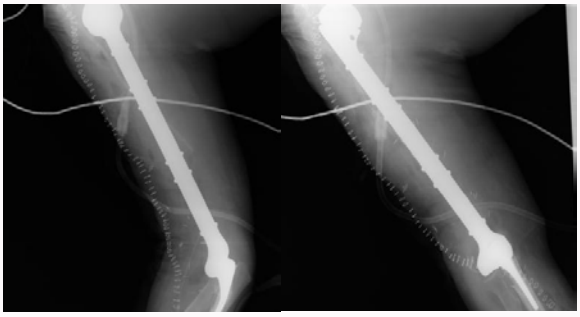

Figure 7: Reconstruction with total humerus replacement in the final operation of the patient.

with total humeral tumour prosthesis as to include the elbow joint was scheduled. For the case for which embolization was scheduled preoperatively in order to reduce the risk of bleeding, embolization was performed by administering polyvinyl alcohol and coil via 5F diagnostic angiographic catheter. The circiumflexartery and other small branches feeding the tumoral tissues in the humeral region were embolized (Figure 5). So when the humerus is resected, less bleeding is detected. After 48 hours embolization, the case was operated and reconstruction with tumour prosthesis was provided (Figure 6). For postoperative stabilization of hemodynamics, the case required only

2 units of blood transfusion (Figure 7).

Discussion

Renal cell carcinoma accounts for 3% of adulthood malignancies and 90% of all renal cancers. It has a potential for causing early metastasis. It can metastasize to any organ, primarily lungs (50-60%), bone (30-40%) and liver (30-40%) [7].

Bone metastasis often arises in 1/3 of cases and clinically frequently as solitary with osseous metastasis of the primary tumour. It is purely lytic, expansile and extremely vascular and usually has an accompanying soft tissue component. The most common bones in which skeletal metastases occur are ribs, vertebra andpelvis as well as long bones of extremities [8]. In our case, bone metastasis occurred in diaphysial part of the humerus 1 year after the nephrectomy.

Because bone metastasis leads to pain, reduced mobility and pathological fractures, it comprises the major cause of morbidity. For bone destruction to be recognized in radiographs, a 40-50% of trabecular bone destruction is required [8]. They seem in direct x-ray as a lytic, destructive and expansile lesion that extends through soft tissue whose margins cannot be recognized clearly. In CT examination, it sometimes seems as bone destruction and accompanying soft tissue mass with contrast uptake [9]. If a bone metastasis is solitary or there is a pain refractory to the treatment or a high risk of developing pathological fractures, then excisions of metastases are required.

It has been reported in various conducted studies that surgical excision of solitary bone metastases influences the lifespan positively [9]. Loss of function in an extremity becomes unavoidable when a pathological fracture occurs. Hypervascularity of metastases may lead to uncontrollable severe intraoperative bleedings and, hence, to technical challenges. The most common indication for transcatheter embolization is preoperative devascularisation. This method is applied in metastatic bone lesions in order to limit intraoperative bleeding.

Although Berkefeld “et al.” [10] reported in their study that embolization applied with preoperative coil was not quite effective in preventing intraoperative bleeding, publications in contrary to it are more and emphasize that it is an effective method [11].

We, too, recognized less bleeding owing to the embolization in our application of total humerus mega prosthesis, which is a more massive surgery compared to the initial operation.

Conclusion

Preoperative embolization of bone metastasis in cases of RCC is a quite safe, effective and repeatable method during stabilization and in control of intraoperative bleeding.

References

1. Jemal A, Murrey T, Samuels A, Ghafoor A, Ward E, Thun MJ. Cancer statistics. Cancer J Clin. 2003;53:5-26.
2. Shvarts O, Lam JS, Kim HL, Han KR, Figlin R, Belldegrun A. Eastern Cooperative Oncology Group performance status predicts bone metastasis in patients presenting with renal cell carcinoma: implication for preoperative bone scans. J Urol. 2004;172(3):867-70.
3. Setlik DE, McCluskey KM, McDavit JA. Best cases from the AFIP: renal cell carcinoma manifesting as a solitary bone metastasis. Radiographics. 2009;29(7):2184-9.
4. Francis IR. Detection, staging and surveillance in renal cell carcinoma. Cancer Imaging. 2006;6:168-74.
5. Wood SL, Brown JE. Skeletal metastasis in renal cell carcinoma: current and future management options. Cancer Treat Rev. 2012;38(4):284-91.
6. Brinkmann OA, Bruns F, Gosheger G, Micke O, Hertle L. Treatment of bone metastasis and local recurrence from RCC with immunochemotherapy and radiation. World J of Urology. 2005;10:1007-13.
7. Thyavihally YB, Mahantshetty U, Chamarajanagar RS, Raibhattanavar SG, Tongaonkar HB. Management of renal cell carcinoma with solitary metastasis. World J Surg Oncol. 2005;3:48.
8. Akmangit I, Kaptanoglu H, Kaptanoglu V. Renal Cell Carcinoma Is Showing Solitary Bone Metastasis After Radical Nephrectomy and Preoperative Transcatheter Embolization Is Applied: A Case Report. Ortadogu tipdergisi. 2013;5(3):171-3.
9. Koike Y, Takizawa K, Ogawa Y, Muto A, Yoshimatsu M, Yagihashi K, et al. Transcatheter arterial chemoembolization (TACE) or embolization (TAE) for symptomatic bone metastases as a palliative treatment. Cardiovasc Intervent Radiol. 2011;34(4):793-801.
10. Berkefeld J, Scale D, Kirchner J, Heinrich T, Kollath J. Hypervascular spinal tumors: influence of the embolization technique on perioperative hemorrhage. AJNR Am J Neuroradiol. 1999;20(5):757-63.
11. Manke C, Bretschneider T, Lenhart M, Strotzer M, Neumann C, Gmeinwieser J, et al. Spinal metastases from renal cell carcinoma: effect of preoperative particle embolization on intraoperative blood loss. AJNR Am J Neuroradiol. 2001;22(5):997-1003.