Solitary Bone Metastasis of Renal Cell Carcinoma Treated with Limb-Sparing Surgery followed by Radiotherapy

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Key words: renal cell carcinoma, metastases, bone, radical surgery, radiotherapy

Solitary lytic bone lesion was diagnosed on the radiograph. The patient was treated with hypofractionated radiotherapy with five daily fractions of 4 Gy, receiving a total dose of 20 Gy.

On admission, the patient complained of left shoulder pain. Physical examination showed left shoulder edema and movement restriction of the left arm. Plain X-ray film and computerized tomography revealed a large osteolytic lesion of the left proximal humerus (Figure). Bone scan with 99mTc showed a focus of non-homogenic isotope retention in the left shoulder. CT of the chest, abdomen and pelvis showed no evidence of local recurrence or metastatic spread.

The patient was referred to the National Unit of Orthopedic Oncology, where total excision of the upper two-thirds of the left humerus including the glenohumeral joint was performed, with replacement by a modular endoprosthesis. A 6 cm mass was located in the head and upper third of the left humerus. Histopathology confirmed the diagnosis of metastatic RCC.

The patient received postoperative radiotherapy to the left shoulder and arm with 1.8 Gy daily fractions 5 days a week, reaching a total dose of 50.4 Gy. Arm function of the left shoulder and upper limb was fully spared. The patient died of myocardial infarction 40 months after surgery. Autopsy was not performed. However, one month prior to her sudden death she was clinically disease-free.

Comment

Up to one-third of patients with RCC have metastases at presentation [1]. Of the remaining two-thirds, approximately 50% will have metastatic disease during the further course of the disease after radical nephrectomy [1]. Despite extensive evaluation of many different treatment modalities, metastatic RCC remains highly resistant to systemic therapy, and the median survival of these patients is approximately 8 months [2]. About 10–20% of patients exhibit complete or partial response to interferon and/or interleukin-2 with or without chemotherapy, but most do not respond and there are few long-term survivors [2]. Preclinical research and clinical evaluation of new agents and treatment programs to identify improved antitumor activity against metastases remain the highest priority in this refractory disease.

The phenomenon of a solitary metastasis in RCC has been the subject of several studies and case reports. The frequency of solitary metastases is 2–3% and 5 year survival rates of 30–50% may be achieved after surgical resection [1]. Patients who develop single metastasis after removal of...
the primary tumor have a better chance of cure and long-term survival compared to those who have metastatic lesion synchronous with primary tumor [3].

A number of controversies exist concerning the optimal treatment modality of solitary bone metastasis of RCC. In the past, the only potentially curative treatment modality in such patients was amputation [1]. Because of the high radioresistance of RCC, radiotherapy of single bone metastasis leads to a good symptomatic improvement in 50-70% patients but does not improve survival [4]. With the development of the concept of limb-sparing surgery in other instances (such as sarcoma surgery), it became possible to use limb-sparing operations with subsequent radiotherapy in such cases [1,5]. Only highly selected patients with strictly proven single bone metastasis and good performance state are candidates for such a procedure [1].

In our patient, long-term survival and freedom from disease with good functional outcome was achieved. The patient's death was not related to the malignancy.

References

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Primary Meningococcal Arthritis

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Arthritis is a recognized complication of acute meningococcal sepsis with or without meningitis [1,2]; however, primary meningococcal arthritis without other manifestations or other organ involvement of meningococcal disease is an uncommon phenomenon. A review of the English medical literature shows that since 1980, 23 cases of primary meningococcal arthritis have been reported and only 3 of them were in the pediatric age [1]. Primary meningococcal arthritis is a rare manifestation of meningococcal infection, especially in the pediatric age. We present a case of primary meningococcal knee arthritis in a 6 year old girl.

Patient Description

A healthy 6 year old girl was admitted due to fever, limping and left knee arthralgia during the previous 2 days, with no evidence of preceding upper respiratory tract infection or skin eruption. On admission, the child had fever (39°C), tachycardia (160 beats/minute), blood pressure 100/50, and normal room air saturation. Neurologic examination did not demonstrate nuchal rigidity, Kernig or Brudzinski signs. The left knee was painful, swollen, tender and red. Voluntary and passive knee motions were limited. The other joints were normal. The rest of the physical examination including the oropharynx was normal. White blood cell count was 13.3 x 10⁹/L with an absolute neutrophil count of 9.3 x 10⁹/L. Erythrocyte sedimentation rate was 53 mm/hour (Westergren method). Blood chemistry results were within normal limits. On admission, left knee arthrocentesis yielded a large amount of purulent fluid with 72 x 10⁹/L white blood cells and 67 x 10⁹/L absolute neutrophils, glucose 96 mg/dl and protein 50 mg/dl. Gram stain showed gram-negative cocci. Other laboratory data – including blood and throat culture, antistreptolysine-O titers, rheumatoid factor, antinuclear factor and complement levels (CH50) – were all normal.

The patient was treated for 2 days with intravenous cloxacillin (150 mg/kg/day), but since the clinical improvement was minimal antibiotic treatment was changed to ceftriaxone (100 mg/kg/day) that led to a marked improvement. Three days after the arthrocentesis, Neisseria meningitides serogroup B was isolated from the synovial fluid, which was sensitive to both antibiotics. Twenty-four hours after initiation of ceftriaxone treatment, body temperature returned to normal. Another two knee aspirations were performed as an integral therapy for septic knee arthritis and because of persistent signs of focal inflammation. No other bacterial growth was detected. The girl was discharged on the 14th day with normal knee examination and range of motion, and oral cefuroxime (250 mg twice a day) for another week.

Comment

Meningococcal infections are transmitted via aerosolization or contact with respiratory secretions leading to upper respiratory infection or colonization. A carrier state