Internal hemipelvectomy due to iliopubic angiosarcoma in a kidney transplantation patient

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ABSTRACT

Immunosuppression therapy has resulted in a decrease in rejection complications in kidney transplantation patients, but unfortunately the appearance of de novo tumors in these patients has been observed. The purpose of this article was to present the clinical case of a kidney transplantation patient that developed a bone angiosarcoma after 4 years of immunosuppression therapy. The clinical case of a malignant bone tumor in the left iliopubic region that was surgically treated with a type II + III internal hemipelvectomy without reconstruction is described in detail. The patient presented with infectious and scarring complications.

RESUMEN

La terapia inmunosupresora ha permitido disminuir las complicaciones de rechazo en pacientes trasplantados renales, lamentablemente se ha observado aparición de neoplasias de novo en estos pacientes. El objetivo es presentar el caso clínico de un paciente que tras cuatro años de terapia inmunosupresora por trasplante renal, desarrolla un angiosarcoma óseo. Se hace una descripción detallada del caso clínico de aparición de neoplasia ósea maligna en la región iliopública izquierda, la cual es tratada quirúrgicamente con una hemipelvectomy interna tipo II + III sin reconstrucción, presentado complicaciones infecciosas y cicatrizales.

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Immunosuppression medications have improved the quality of life of transplantation patients by reducing rejection. However, the appearance of tumors in a high percentage of these patients has been observed.

Tumor presentation in immunosuppressed patients due to kidney transplantation is directly proportionate to the immunosuppression intensity and duration. The most common tumors to develop are skin cancers and lymphomas, not bone angiosarcoma. Internal hemipelvectomy is not routinely performed and it has a high complication rate.

**Keywords:** Kidney transplantation, immunosuppression therapy, angiosarcoma, internal hemipelvectomy, Mexico.

**INTRODUCTION**

Life expectancy for kidney transplantation patients has improved considerably in the last few years. Initially post-transplantation treatment focused on resolving the most urgent situations, such as the immediate postoperative period, acute rejection crisis management, and infections. As these situations were gotten under control, other later-appearing ones arose, such as cardiovascular disease and cancer. This latter disease has a directly proportional association with immunosuppression duration.

The risk for tumor development is rising in the patient with chronic renal failure and in the patient on dialysis. The incidence of cancer is even greater in the post-transplantation period and it is estimated to reach 40% to 50% of the cases at 10 years, with skin cancer and lymphomas being the most frequent.

The term angiosarcoma is applied to a wide variety of intermediate to high grade malignant endothelial tumors affecting various extraskeletal locations. They occur most commonly in the dermis and in the subcutaneous cell tissue as well as in regions of the head and neck. Other sites that are seen to be involved with certain frequency are the breast, liver, spleen, and the bones. In general there is little information in the literature in relation to this entity located in the bone.

The iliac is a bone that can have the same neoplastic lesions as any other. However, outcome is worse for this bone than for other similar skeletal ones.

Because the pelvis does not have any major anatomic barriers to tumor extension and because it is close to important organs such as the bladder, the urethra, the ureters, the rectum, and neurovascular structures, it becomes an extremely complicated site for performing resections with tumor-free margins.

Internal hemipelvectomy is a non-amputative surgery indicated for iliac, proximal femur, or proximal muscle tumors in which there is no vascular invasion. Internal pelvic resections are classified based on the segment or segments that are resected: segment I corresponds to the iliac wing; segment II to the acetabulum; and segment III to the iliopubic ramus and the ischiopubic ramus. Based on the Enneking and Dunham classification modified by Malawer, when femoral head and neck resection is added to acetabulum resection, it corresponds to a type IIA resection. The corresponding hemisacrum is called segment IV.

**CASE PRESENTATION**

A 22-year-old man was sent to the State of San Luis Potosí for outpatient consultation at the Orthopedic Oncology Service of the Advanced Specialty Medical Unit – Traumatology and Orthopedics Hospital No. 21, of the IMSS, in Monterrey, Nuevo León, due to a giant cell tumor of the left iliopubic ramus.

Important past medical history: bilateral renal hypoplasia, allergy to beta-lactams and cephalosporins,
cadaveric donor kidney transplantation housed in the right iliac fossa, postoperative scarring and infectious problems (4-year progression), mycophenolate and cyclosporine use since the transplantation, and one month progression of incisional tumor biopsy of the left iliofemoral ramus. The Pathologic Anatomy Department was asked to review the slides the patient had with him (Figure 1).

Physical examination revealed a scar in the right iliac fossa from the kidney transplantation and a left inguinal scar from the biopsy that was carried out. Upon palpation there was a slight increase in volume and compliance in the left inguinal region. The patient could only partially stand on the affected extremity and with the help of crutches.

The radiologic information showed an expansive stone lesion of the left iliofemoral ramus involving the pelvis at the distal and middle zones of the acetabulum. Computed axial tomography (CAT) scan also identified an expansive and stony lesion, posteromedial cortical rupture, and soft tissue involvement (Figures 2 and 3).

The result of the slide review was angiosarcoma of the left iliofemoral ramus. A second revision at the Specialty Hospital No. 25 produced the same result and diagnosis was corroborated.

Physicians specializing in nephrology, urology, medical oncology, surgical oncology, transplantations, and orthopedic oncology discussed the case and the decision was made to take the patient directly to surgery.

Internal hemipelvectomy of left segments II and III with no type of reconstruction was performed. There were no intraoperative complications. Short fiberglass boots were placed that were joined by a crosspiece for the purpose of maintaining distance and position in the hip so enough fibrosis could be produced to allow support (Figure 4).

There was damage to the wound edges in the medial region so it was debrided in order to have secondary intention closure.

Ten days after the surgical event, the patient presented with the clinical symptoms of urinary infection attributable to the Foley catheter. On day 12 during wound care approximately 50 mL of very fetid purulent matter was drained and culture was positive for E. coli with a maximum sensitivity to amikacin.

Up to that point, the patient continued his medications based on mycophenolic acid and cyclosporine. Due to the patient’s allergies and to the nephrotoxicity of aminoglycosides, antibiotic therapy based on ciprofloxacin in addition to wound care was carried out every eight hours for one month until the infectious process was controlled. The patient was sent to the Hospital General de Zona for his continued management and wound surveillance. Intravenous antibiotic therapy was continued until cicatrization was complete, which

Figure 1. Pelvic CAT scan. Kidney transplantation housed in the right iliac fossa.

Figure 2. Conventional radiograph. Expansive stone lesion in the left iliofemoral ramus and acetabulum.
occurred six weeks after the spontaneous drainage of the abscess.

The definitive pathologic report indicated angiosarcoma in the left iliopubic ramus with non-articular acetabulum involvement and in the soft tissues. Surgical margins were tumor-free. The nephrology and medical oncology services of the patient’s corresponding Hospital General de Zona decided to begin chemotherapy. At 2.5 months after the surgical event, the fiberglass boots were removed and physical rehabilitation was begun. The patient was able to stand on the affected extremity with the help of a walker six months after the surgical event (Figure 5).

Current follow-up is two years and six months. There is no evidence of local or distant neoplastic disease. The patient has made significant improvement in his ability to stand on his own, but he still needs a walker to get around.

**DISCUSSION**

The association between immunosuppression therapy and the development of tumors in kidney transplantation patients is well known. Cutaneous and lip tumors, followed by solid lymphomas are the most frequently developed cancers in the transplantation population. Primary angiosarcoma of the bone is an uncommon lesion and hemipelvectomy is also an uncommon procedure. The infectious process developed in this patient was expected, due to the high incidence of infectious processes associated with this procedure and to the harm from receiving immunosuppression therapy that is a consequence of kidney transplantation. The difficulty in controlling the infectious process was exacerbated by the isolated pathogen and its specificity for amikacin to eradicate it. However, due to the nephrotoxicity of the aminoglycosides, ciproflaxin was decided upon, along with wound care three times a day. Any type of reconstruction at the pelvic level would have increased the risk for developing a more severe infectious process, for which the implants, whether they were metal, prostheses, or grafts, would most likely have to be removed and as a consequence, an already susceptible patient would have to undergo another surgery.

**CONCLUSIONS**

The advances in immunosuppression therapy have generalized an increase in the quality of life and life expectancy of kidney transplantation patients. The appearance of de novo cancers is a frequent complication in these patients and the said risk is in proportion to the duration and intensity of immunosuppression therapy. The pelvis can house the same tumors that settle on the appendicular skeleton, but because the pelvic ring lacks effective anatomic barriers, tumor outcome is worse. Bone angiosarcomas are uncommon tumors and there is
little reported on them in the literature. Hemipelvectomy is an aggressive procedure with a high complication rate but it is a good option in the treatment of pelvic tumors and preserves an otherwise normal extremity.

**CONFLICT OF INTEREST**

The authors declare there is no conflict of interest.

**FINANCIAL DISCLOSURE**

No financial support was received in relation to this study.

**REFERENCES**