Bone metastases from renal carcinoma 20 years after diagnosis

Raúl Carrillo-Esper,* Amy Peralta-Prado, Verónica Zarate-Vega,*** María Isabel Lavenant-Borja******

CLINIC CASE

A 83 years old female with familiar history of lung cancer. The patient's history includes Pott's disease at 29 years old and systemic arterial hypertension. She underwent right nephrectomy for clear cell carcinoma 20 years ago with oncological follow-up by 13 years without evidence of tumor activity. 30 days before hospital admission she fell and developed severe pain in lower back and right hip for which she received non-steroidal anti-inflammatory, pregabaline and buprenorphine without presenting improvement. She denies fever or weight loss. Physical examination with pallor, tachycardia and pain on right hip movilization, shortening and external rotation of right leg. Laboratories showed hemoglobin 10.2 g/dL, calcium 9.5 mmol/L, corrected calcium 10.5 mmol/L. On plain pelvis radiograph, it was observed right hip pathologic fracture (Figure 1). The magnetic resonance imaging (MRI) showed right hip fracture with significant perilesional edema and tumoral infiltration (Figure 2). The patient underwent bone biopsy of the right hip. The histological diagnosis was bone metastasis of renal clear cell carcinoma (RCCCa) (Figure 3).

Renal adenocarcinoma (RCC) originates in renal cortex and accounts for 3% of adult malignancies and 85% of adult kidney cancers.[1,2] In 2007, 58,000 new cases of RCC were reported in the United States with a mortality of 12,980 patients. Diagnostic age is 40 years old, and the disease occurs predominantly in the seventh and eighth decades of life with a male predominance at 1.6:1.0, and a peak of incidence in the sixth and seventh decade.[3] Risk factors are cigarrete smoking, obesity, hypertension and intakes of red meat cooked by grilling or pan-frying.[4]

Five types of carcinomas are distinguished: clear-cell carcinoma, chromophilic (papillary), chromophobic, oncocytic, and collecting-duct (Bellini's duct) tumors.[4,5]

RCCCa is considered from 75 to 85% of the tumors developed in the proximal tubule, and characterized by a deletion of chromosome 3p. The presence of a sarcomatoid pattern correlates with a poorer prognosis.[2,3]

Figure 1. Plain pelvis radiograph showing right hip fracture associated with expansive bone lesion (arrow).

* National Medicine Academy. Mexican Surgery Academy. Intensive Care Unit. Médica Sur Clinical Foundation.
** Internal Medicine Residency. Dr. Manuel Gea González Hospital. *** Intensive Care Residency. Médica Sur Clinical Foundation.
**** Pathology Deparment. Médica Sur Clinical Foundation.

Correspondencia:
Verónica Zarate-Vega
Intensive Care Unit. Médica Sur Clinical Foundation
Puente de Piedra, Núm. 150. Col. Toriello Guerra, México, D.F. C.P. 14050
Tel.: 5424-7200. Ext. 4139. Correo electrónico: capitantsuvasa@hotmail.com

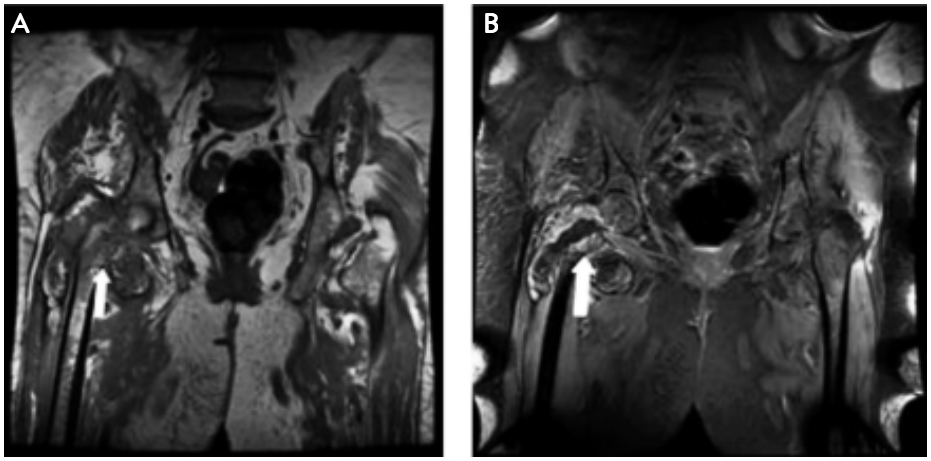

Figure 2. MRI shows basicervical proximal fracture of the right femur with varus angulation of the epiphysis, edema and tumoral infiltration (arrow).

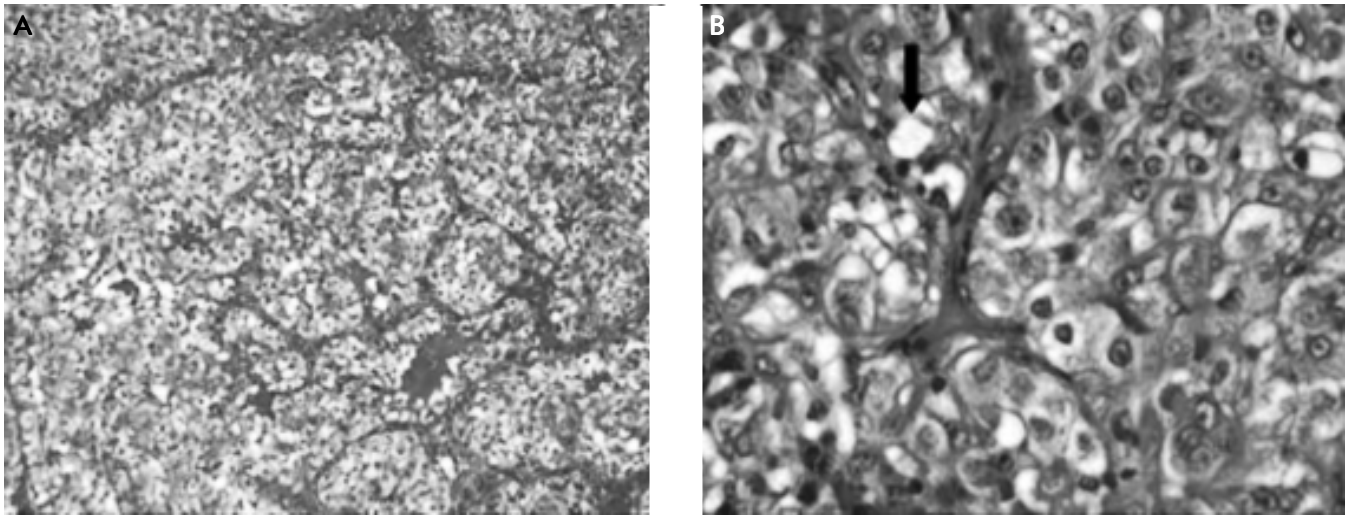

Figure 3. Bone biopsy showing. **A.** Well-formed cells nests delimited by vascular pattern, characterized by neoplastic cells with clear cytoplasm, hyperchromatic and large nuclei and atypical mitosis. **B.** Malignant renal carcinoma cells characterized by clear cytoplasm and atypical mitosis (arrow).

Thirty percent of cases have advance disease at the time of diagnosis. In these cases, mortality can be up to 99% in 5 years, due to the lack of response to current treatments. A third of the patients who undergo nephrectomy of localized disease will have a recurrence, reports demonstrates recurrence after 10 years.[5,6] Ohno, *et al.*, 2012, showed a recurrence after nephrectomy, when preoperative neutrophil-to-lymphocyte ratio was > 2.7 at 10 years follow-up.[7]

Renal cell carcinoma has been found to metastasize virtually to all areas. Hoffman, *et al.*, 2008, reported that lung metastases accounts for 51% and bone metastases for 21%.[8] In the last percent (20 to 25%), the most common sites of involvement were the pelvis and ribs (48%), followed by the spine (42%), then the long bones and skull. The mechanisms are complex and involve tumor stimulation of the osteoclasts, osteoblasts and other components of the bone microenvironment. Median survival for patients with metastatic disease is about 13 months. Patients with a clear-cell histological type, with bone metastases, and a solitary metastasis have superior survival rates.[9]

ABBREVIATIONS

- **MRI:** magnetic resonance imaging.
- **RCC:** renal adenocarcinoma.
- **RCCCa:** renal clear cell carcinoma.

REFERENCES

1. Cohen HT, McGovern FJ. Renal-Cell Carcinoma. *N Engl J Med* 2005; 353: 2477-90.
2. Motzer J, Bander N, Nanus D. Renal Cell carcinoma. *N Engl J Med* 1996; 12: 865-75.
3. Sahi C, Knox J, Clemons M, Joshua A, Broom R. Renal cell carcinoma bone metastases: clinical advances. *Therapy Advances Med Oncol* 2010; 2: 75-83.
4. Daniel CR, Cross AJ, Graubard BI, Park Y, Ward MH, Rothman, et al. Large prospective investigation of meat intake, related mutagens, and risk of renal cell carcinoma. *Am J Clin Nutr* 2012; 95: 155-62.
5. Szendroi A, Dinya E, Kardos M, Szász AM, Németh Z, Ats K, et al. Prognostic factors and survival of renal clear cell carcinoma patients with bone metastases. *Pathol Oncol Res* 2010; 16: 29-38.
6. Arroyo C, Palacios P, Uribe N, Barrera M, Feria G. Metástasis atípicas en carcinoma renal. *Gac Med Mex* 2005; 141: 543-6.
7. Ohno Y, Nakashima j, Ohori M, Gondo T, Hatano T, Tachibana M. Follow-up of neutrophil-to-lymphocyte ratio and recurrence of clear cell renal cell carcinoma. *J Urol* 2012; 187: 411-7.
8. Hoffmann N, Gillett M, Cheville JC, Lohse CM Leibovich BC, Blute M. Differences in organ system of distant metastasis by renal cell carcinoma subtype. *J Urol* 2008; 179: 474-7.
9. Lin PP, Mirza AN, Lewis VO, Cannon CP, Tu SM, Tannir NM, et al. Patient survival after surgery for osseous metastases from renal cell carcinoma. *J Bone Joint Surg Am* 2007; 89: 1794-801.