ACTA MEDICA LITUANICA. 2018. Vol. 25. No. 4. P. 226–233

Sternal resection of a solitary renal cell carcinoma metastasis: a case report and a literature review

Minija Čerškutė[3],

Marius Kinčius[1],

Tomas Januškevičius[3],

Saulius Cicėnas[2, 3],

Albertas Ulys[1]

[1] *Department of Onco-urology, National Cancer Institute, Vilnius, Lithuania*

[2] *Department of Thoracic Surgery and Oncology, National Cancer Institute, Vilnius, Lithuania*

[3] *Faculty of Medicine, Vilnius University, Vilnius, Lithuania*

Background. Renal cell carcinoma (RCC) may be metastatic, although solitary sternal metastasis of RCC is a rare medical condition. Here we report an unusual case of a 63-year-old male with a solitary sternal metastasis as an initial presentation of clear-cell renal cell carcinoma.

Materials and methods. A 63-year-old male presented with a small sternal mass. Chest computer tomography (CT) and a biopsy from the sternal tumour were performed. Histopathological examination revealed the diagnosis of renal clear cell carcinoma metastasis to the sternal bone. On the basis of a subsequently performed abdominal CT the patient was confirmed with a suspicion of a left renal lower pole tumour. Treatment with sunitinib was initiated. Due to the limited response and a growing sternal mass, the patient was admitted to the National Cancer Institute after two cycles of sunitinib therapy. Open left partial nephrectomy was performed followed by the resection of the sternal metastasis two months later. The chest wall was reconstructed with polypropylene mesh combined with transversal rectus abdominis musculocutaneous flap.

Results. The postoperative course after the partial nephrectomy was uneventful. The postoperative course of metastasectomy complicated with the right pneumothorax which was successfully treated by insertion of a chest tube. Bleeding from the upper digestive tract also occurred on the seventh postoperative day but was successfully controlled by haemostasis with three 20 ml endoscopic injections of 1:10,000 solution of epinephrine. The patient had been followed up after the surgery for 30 months with biannual chest and abdominal CT scans that showed neither local nor distant recurrence of the disease.

Conclusions. Radical surgical treatment of a solitary renal clear cell carcinoma metastasis may offer the best cancer-specific outcomes and improve the quality of life in some patients.

Keywords: sternum, bone metastasis, renal cell carcinoma, resection

Correspondence to: Minija Čerškutė, Faculty of Medicine, Vilnius University, 21 M. K. Čiurlionio St., Vilnius 03101, Lithuania.
Email: minija.cerskute@gmail.com

INTRODUCTION

Renal cell carcinoma (RCC) is the most common malignancy of the kidney. Over the last two decades, the incidence of RCC has increased by about 2% both worldwide and in Europe (1). In 2012, there were approximately 84,400 new cases of RCC in Europe (2).

RCC is known for the ability to metastasize by venous and lymphatic routes. It rarely presents with a typical triad of symptoms – flank pain, haematuria and a palpable abdominal mass. However, initially it has an asymptomatic clinical course and about 25–30% of patients present with metastatic disease at the time of diagnosis (3, 4). Occasionally the first symptoms might be due to metastatic lesions. Frequent localizations of RCC metastases are lungs (50% to 60%) (5), liver (30% to 40%), and bones (30% to 40%) (6). Common sites of osseous metastasis were reported to be in the spine, femur, humerus, and pelvic bones (7). Atypical RCC metastatic sites also occur. For example, isolated metastasis to the sternum is considered a rare condition (8). In the literature review, only a few cases of RCC with a solitary sternal metastasis were reported (3, 9–17).

Prognosis of untreated metastasized RCC is poor. Only 10% of patients presenting with metastases survive for more than five years (18). Probably the main reason for such a low survival rate is an insufficient metastasis response to radiation and chemotherapy, although new agents for targeted therapy have improved the clinical outcomes for the patients with metastatic RCC (19). On the recommendations of European Society for Medical Oncology, systematic treatment of patients with metastatic RCC (mRCC) differs according to risk stratification and may be used as a first- or second-line therapy (20). The list of treatment options has been extended from cytokines: interleukin-2 and interferon (IFN)-α to such molecular-targeted therapies as sorafenib, sunitinib, temsirolimus, bevacizumab (plus IFN-α), everolimus, pazopanib, and axitinib. Additional therapeutic options have led to higher median overall patient survival (OS) from a baseline of 12 to more than 30 months (21).

Bone metastases may cause significant complications including pain, spinal cord compression with or without neurological deficit, pathological fractures and/or hypercalcaemia. Therefore patients with metastatic RCC should always be considered for multimodal therapy, including surgery of metastatic lesions. In order to achieve local disease control and improve patient outcomes, a number of authors recommend surgical management of skeletal metastases (6, 7). However, better survival is usually seen in a selected group of patients who have a better performance status (ECOG 0), node-negative disease after nephrectomy (N0), solitary bone metastasis, and lower histological tumour grade (19, 22).

We report a case when a 63-year-old male was successfully treated for renal clear cell carcinoma with a solitary bone metastasis to the sternum.

CASE PRESENTATION

A previously healthy 63-year-old male presented to the department of oncology of a regional hospital in April 2014. He had a history of sternal pain for a six-month period and a palpable mass in the chest, without any other pathological signs or symptoms. At presentation, his ECOG was 0. Blood tests revealed the following normal levels of: WBC (3.4 × 10(9)/l), PLT (155 × 10(9)/l), HB (127 g/l), urea (4.5 mmol/l), creatinine (42 μmol/l), bilirubin (9.3 μmol/l), CRP (3 mg/l), Na (148 mmol/l), K (4.5 mmol/l). The urine samples were as follows: SG (1.005), PRO g/l (neg), KET mmoll/l (neg), LEU/ μl (25), ERY/ μl (neg), NIT (neg). Computed tomography (CT) of the chest displayed a soft-tissue mass with heterogeneous contrast enhancement in the middle/lower part of the sternum (34 × 42 mm) with no evidence of lung or lymphatic nodes lesions (Fig. 1). A percutaneous needle biopsy was performed from the middle part of the sternum and a pathological examination revealed a possible ccRCC metastasis. Further research for a primary tumour was undertaken. Contrast-enhanced CT of the abdomen was performed in May 2014 and displayed a heterogeneous (34 × 36 mm) vascularized parenchymal exophytic lesion in the lower pole of the left kidney (Fig. 2). Targeted therapy with sunitinib was administrated to the patient at a dose of 50 mg orally once daily for four weeks, followed by two weeks off treatment. However, due to the significantly increasing size of the sternum tumour and no significant response to

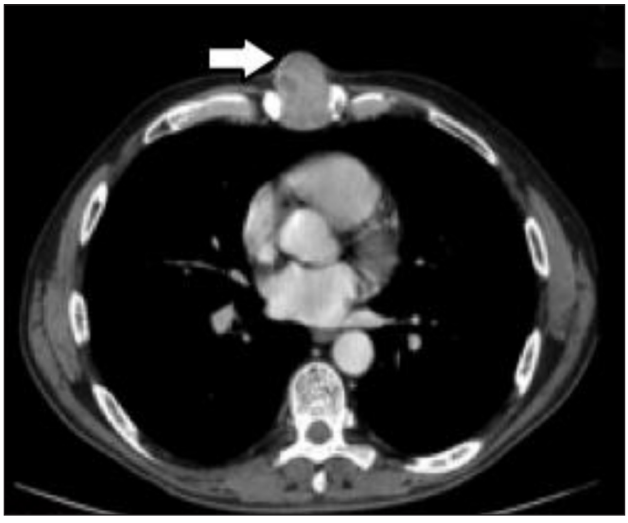

Fig. 1. Computed tomography of the chest in April 2014. A solid mass tumour in the sternum (arrow)

the treatment he underwent only two cycles of treatment and in 2014 July was referred to National Cancer Institute with an increased local volume of the middle part of the sternum and worsening pain and requiring opioid analgesics. To evaluate disease progression, CT scans of the chest, abdomen, and pelvis were repeatedly performed. The diameter of the metastasis of the sternum increased to 4.8 mm, but no other distant metastases were found. To exclude other skeleton metastases, bone scanning was performed and showed

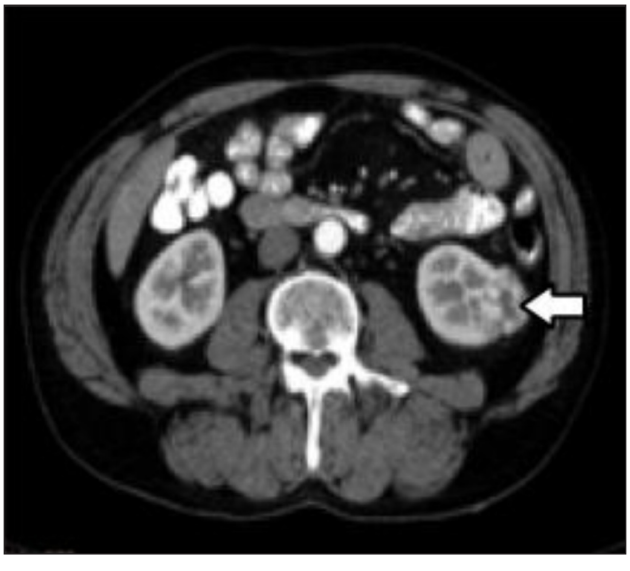

Fig. 2. Computed tomography of the abdomen in May 2014. A solid tumour in the left kidney (verified as clear cell RCC, arrow)

radionuclide uptake only in the middle/lower part of the sternal bone body. His vital signs were stable and there were no abnormalities on physical examination, blood tests were as following: WBC (3.92 × 10(9)/l), PLT (158 × 10 (9)/l), HB (129 g/l), urea (4.8 moll/l), creatinine (45 μmol/l), bilirubin (9.5 μmol/l), CRP (3.4 mg/l), Na (147.4 mmol/l), K (4.2 mmol/l), ALT (8 U/l), AST (11 U/l), ALP (73 U/l), Ca (2.4 mmol/l). A multidisciplinary team meeting consisting of a urologist, a medical oncologist, a radiation oncologist, and a thoracic surgeon recommended two-stage surgery: partial left nephrectomy followed by resection of the sternum metastasis.

Six weeks after the discontinuation of sunitinib, in August 2014, open left partial nephrectomy was performed. The postoperative clinical course was uneventful and the patient was discharged and sent to rehabilitation on the seventh day after the operation. Pathological examination of the resected tissue revealed a diagnosis of renal clear cell carcinoma pT1a, Grade 3. Two months later, he was admitted to our hospital once again and a partial resection of the sternal bone body, xiphoid process, and of the whole tumour tissue with wide margins were performed. The chest wall was reconstructed with polypropylene mesh combined with TRAM flap in order to provide chest wall stability and minimize ventilatory impairment. The operation took 6 hours and 25 minutes with a 400 ml surgical blood loss in total. On the second postoperative day, dyspnea and chest discomfort occurred. The chest X-ray revealed a right pneumothorax, which was managed by inserting a chest tube. Despite the acid suppression therapy (AST) for the stress ulcer prophylaxis (SUP) with omeprazole, bleeding from the upper digestive tract occurred on the 7th postoperative day. Esophagogastroduodenoscopy revealed bleeding from a small ulcer in the duodenum which was successfully controlled by initial haemostasis with three 20 ml endoscopic injections of a 1:10,000 solution of epinephrine. No other complications developed and the patient was discharged on the fourteenth postoperative day with the definitive diagnosis of ccRCC pT1aN0M1 G3. Shortly after the last operation he stopped using painkillers. No subsequent radiotherapy or systemic immunotherapy was given to this patient.

RESULTS

After surgery, the patient was followed up for 30 months with biannual chest and abdominal CT scans (Fig. 3). During the last check-up in April

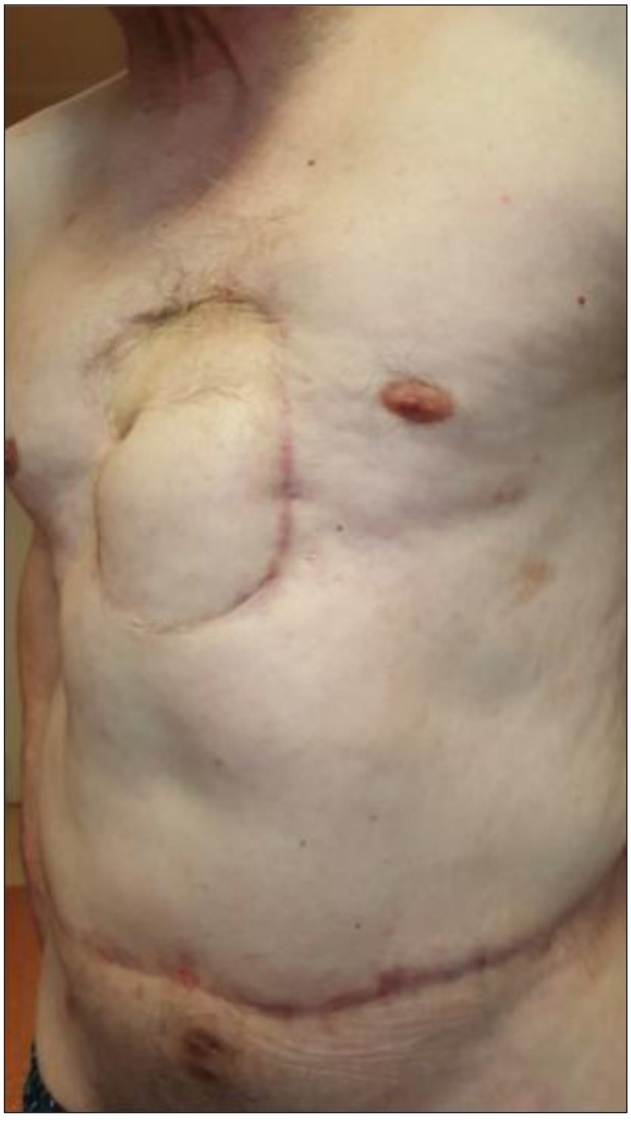

Fig. 3. Clinical image of the patient. TRAM flap is functioning well

2017, the CT revealed postoperative changes in the sternal bone and the left kidney, but neither local nor distant recurrence of the disease (Fig. 4).

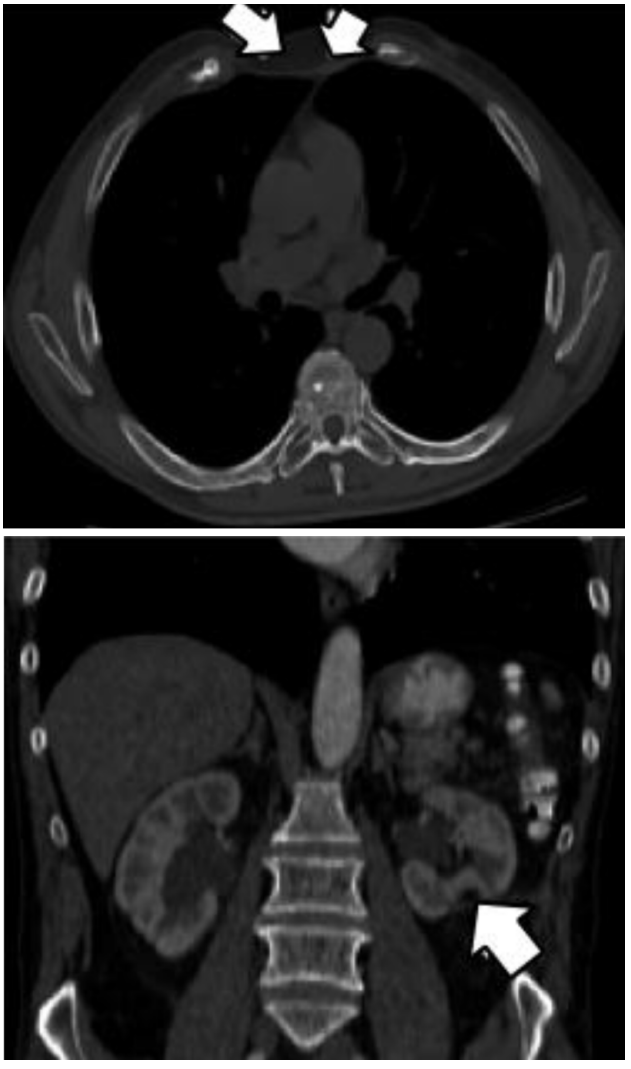

Fig. 4. Computed tomography axial (A) view, bone window. No recurrence of the disease in the resected area (arrows). Left kidney resection, coronal (B) view, no local recurrence visible (arrow). April 2017

DISCUSSION

Bone metastases are highly vascular and destructive lesions. They can cause life-threatening bleeding during surgical treatment and are resistant to other forms of treatment. Less than 5% of metastatic RCCs respond to systematic chemotherapy, therefore, no agent alone should be considered a standard in the treatment of a metastatic disease (23). Radiation therapy is sometimes used to relieve the pain associated with metastasis and is considered as an option of palliative therapy. Immunotherapy has shown promising results in treating patients with metastatic RCC, however, the response rate is only 15%. Although new targeted therapy substances have been introduced into the clinical practice in the past decade, unfortunately, complete cure occurred in a small group of the treated patients (24). Surgery could be considered a first-line therapy in selected patients in the case of solitary bone metastasis of RCC (12). Cytoreductive surgery of the primary tumour and

removal of a solitary metastasis is the treatment of choice for these patients (25).

Usually patients with osseous metastases of RCC have an unfavourable prognosis. In some studies, more than 50% of patients die within the first year (7, 19, 26). Patients with untreated metastatic disease have a 5-year survival of 0–18% (27). The most important thing for a physician consulting patients with metastatic RCC is to recommend the most appropriate treatment. The decision should be based on such factors as patient's age, morbidities, the site and number of metastases, a possibility of complete resection, differentiation grade, and the patient's wishes (26). For a patient with expected long-term survival, an aggressive surgical resection should be considered (7, 19).

The first successful surgical resection of metastasis with nephrectomy in a patient with a solitary pulmonary metastasis of renal cell carcinoma was performed in 1961. The patient survived for 23 years without recurrence of the disease, and a more aggressive surgical approach to solitary RCC metastasis has been favoured since then (22). Resection of bone metastases together with radical/partial nephrectomy aims to prevent the development of recurrent metastasis, avoid pathological bone fractures, alleviate pain, increase functional mobility, and prolong patients' survival (8, 28). Kozlowski et al. showed that after surgical resection of a solitary metastatic lesion a two-year survival was 22% (28). Fottner and his colleagues retrospectively reviewed 101 patients who underwent surgical treatment for skeletal metastases of renal cell carcinoma. A solitary bone metastasis was diagnosed in 27 patients, 20 patients had multiple bone metastases, and 54 patients had concomitant visceral metastases. The overall 1-year survival was 58%, 2-year survival was 37%, and 5-year survival was 12%. Patients with a solitary bone metastasis have a better survival compared to patients with a multiple metastases. Predictors of overall survival included age below 65 years, absence of pathologic fractures, and tumour-free resection margins (29). Their study proved that patients with a solitary skeletal metastasis are good candidates for extended surgery.

Kollender et al. (6) reported 45 patients (56 lesions) with metastatic RCC to bone, who underwent surgical excision of metastatic renal cell carcinoma. Survival of more than two years after the surgery was in 22 patients (49%) and more than three years in 17 patients (38%). The results showed that surgical excision of the metastasis has a significant effect on achieving local tumour control, pain relief, and relative extension of survival.

The first 5-year survivors reported in literature in 1972 were two elderly males who both underwent resection of sternal tumour and nephrectomy (10). Another patient who survived <4.5 years had a long asymptomatic period after the nephrectomy followed by radiotherapy and radical anterior chest wall resection with Marlex mesh reconstruction (11). The literature reported two cases of radical nephrectomy, sternal tumour resection, and reconstruction as one-stage procedures. Pyle with colleagues wrote of their experience performing nephrectomy and sternal resection/reconstruction with a Prolene methylmethacrylate sandwich for a 2.2 × 4.5 cm sternal metastasis of renal cell carcinoma (16). They also continued with local radiation to the chest wall together with systemic immunotherapy. Ho-Yin Ngai et al. (13) used polypropylene mesh and vertical rectus abdominis myocutaneous (VRAM) flap to repair the chest wall defect, but their patient received no subsequent radiotherapy or systemic immunotherapy after the operation and died 17 months later after the nephrectomy with development of multiple lumbar spine metastases. Another author in 2008 (14) reported a 63-year-old male patient, who underwent radical nephrectomy and received palliative radiotherapy with chemotherapy for a T4N0M1 RCC. Lee with colleagues (12) created a chest wall reconstruction from methylmethacrylate between two layers of polypropylene mesh for a patient who previously underwent bilateral nephrectomies. Similar to our case, all lesions in the sternum were painless at presentation. Most of the patients were elderly men who underwent nephrectomy and resection of the isolated metastasis (only one received radio- and chemotherapy).

Lin and colleagues (19) performed a retrospective review of 295 patients with a total of 368 metastases who underwent surgical procedures of a solitary metastasis of RCC. The overall one- and five-year survival rates were 47% and 11%. They also recognized that the patients who had either a solitary bone lesion or multiple bone-only metastases had better overall survival rates. A histological subtype of clear-cell carcinoma was also related to better survival (Table). These results are

Table. Case reports of patients with RCC and a solitary sternal metastasis in literature:

Authors	Published (year)	Patient age (years), sex	Treatment, techniques	Results
C. E. Yale, J. B. Wear (10)	1972	Two elderly males	Two operations: subtotal sternal resection and nephrectomy	Survived for >5 years
A. S. Estrera et al. (11)	1981	44, male	Several operations. Nephrectomy followed by radiotherapy and radical anterior chest wall resection with Marlex mesh reconstruction	Died after ~4.5 years
J. W. Pyle et al. (16)	2005	47, female	Nephrectomy and sternal resection at the same time (reconstruction with Prolene mesh and bilaminate methylmethacrylate sternal shield). Continuing with local radiation to the chest wall and systemic immunotherapy	Alive for 6 months after the operation, no further data
Ho-Yin Ngai et al. (13)	2007	67, male	Nephrectomy combined with sternal resection (reconstruction with the Prolene mesh and VRAM flap)	Died after 17 months
Baltic V. (14)	2008	63, male	Nephrectomy and palliative radiotherapy, continuing with chemotherapy (Vinblastine)	No data
S. Y. Lee et al. (12)	2011	62, male	Sternal resection and reconstruction with methylmethacrylate between two layers of Prolene mesh	No data
Present case	2016	63, male	Two operations: partial nephrectomy and sternal resection (reconstruction with polypropylene mesh combined with TRAM flap)	Alive for 25 months after the operation

important when choosing the appropriate treatment, especially considering surgical techniques.

CONCLUSIONS

In accordance with other studies, this clinical case illustrates that aggressive surgery with removal of the primary tumour along with a metastasectomy is a relevant treatment option in patients of a good general condition with a single RCC metastasis in the sternal bone. In the case of a lack of response to medical therapy or radiation, these patients should be considered for surgery to prolong the survival and disease-free period. However, prospective studies are needed before this can be applied as a standard treatment choice.

CONFLICT OF INTEREST

We declare no conflict of interest. Informed consent was obtained from the patient for the report of the case and the use of the images.

Received 23 April 2018
Accepted 19 February 2019

References

1. Lindblad P. Epidemiology of renal cell carcinoma. Scand J Surg. 2004; 93(2): 88–96.
2. Ferlay J, Steliarova-Foucher E, Lortet-Tieulent J, Rosso S, Coebergh JW, Comber H, et al. Cancer incidence and mortality patterns in Europe: estimates for 40 countries in 2012. Eur J Cancer. 2013; 49(6): 1374–403.
3. Batista RR, Marchiori E, Takayassu TC, Cabral FC, Cabral RF, Zanetti G. Sternal metastasis as an initial presentation of renal cell carcinoma: a case report. Cases J. 2009; 2: 9045.
4. Gupta K, Miller JD, Li JZ, Russell MW, Charbonneau C. Epidemiologic and socioeconomic burden of metastatic renal cell carcinoma (mRCC): A literature review. Cancer Treat Rev. 2008; 34(3): 193–205.
5. Cozzoli A, Milano S, Cancarini G, Zanotelli T, Cosciani Cunio S. Surgery of lung metastases in renal cell carcinoma. Br J Urol. 1995; 75: 445–7.
6. Kollender Y, Bickels J, Price WM, Kellar KL, Chen J, Merimsky O, et al. Metastatic renal cell carcinoma of bone: indications and technique of surgical intervention. J Urol. 2000; 164: 1505–8.

7. Jung ST, Ghert MA, Harrelson JM, Scully SP. Treatment of osseous metastases in patients with renal cell carcinoma. Clin Orthop Relat Res. 2003; 409: 223–31.
8. Brufau BP, Cerqueda CS, Villalba LB, Izquierdo RS, González BM, Molina CN. Metastatic renal cell carcinoma: radiologic findings and assessment of response to targeted antiangiogenic therapy by using multidetector CT. Radiographics. 2013; 33(6): 1691–716.
9. Nakajima T, Suzuki M, Ando S, Iida T, Araki A, Fujisawa T, et al. Spontaneous regression of bone metastasis from renal cell carcinoma: a case report. BMC Cancer. 2006; 6: 11.
10. Yale CE, Wear JB. Subtotal sternal resection for metastatic renal cell carcinoma. Arch Surg. 1972; 105: 87–9.
11. Estrera AS, Platt MR, Mills LJ, Shaw RR. Pulsatile sternal tumour: report of three cases and a review of the literature. Ann Thorac Surg. 1981; 31: 244–50.
12. Lee SY, Lee SJ, Lee CS. Sternum resection and reconstruction for metastatic renal cell cancer. Int J Surg Case Rep. 2011; 2: 45–6.
13. Ngai HY, Ho LY, Chan TF, So HS, Velayudhan V, Lam SH. Rare presentation of renal cell carcinoma: solitary sternal metastasis. Surg Pract. 2008; 12: 99–101.
14. Baltic V. Rare solitary sternal metastasis of renal cell carcinoma. Arch Oncol. 2008; 16: 13.
15. Li JS, Zhou CK, Yi CH, Zhang WD, Li L. An unusual case of metastatic renal clear cell carcinoma presented as a solitary subcutaneous mass invading the manubrium. QJM-INT J Med. 2015; 108(2): 161–2.
16. Pyle JW, Ash JL, Hussain SM, Reid N, Anderson RC. Sternal resection and reconstruction after renal cell carcinoma metastatic to the sternum. J Thorac Cardiovasc Surg. 2005; 129(5): 1177–8.
17. Hoyland K, Vasdev N, Nathan P, Hanbury D. Painless pulsatile mass as first presentation of renal cell carcinoma. Int J Cancer Oncol. 2014; 2: 02036.
18. Motzer RJ, Bacik J, Mazumdar M. Prognostic factors for survival of patients with stage IV renal cell carcinoma: memorial sloan-kettering cancer center experience. Clin Cancer Res. 2004; 10(18 Pt 2): 6302S–3S.
19. 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(8): 1794–801.
20. Escudier B, Porta C, Schmidinger M, Algaba F, Patard JJ, Khoo V, et al. Renal cell carcinoma. ESMO Clinical Practice Guidelines Ann Oncol. 2014; 25(suppl 3): iii49–56.
21. Pickering LM. Advances in systemic therapy for renal cell carcinoma. ASCO. 2016 Jan 9.
22. Diirr HR, Maier M, Pfahler M, Baur A, Rejior HJ. Surgical treatment of osseous metastases in patients with renal cell carcinoma**.** Clin Orthop Relat Res. 1999; 367: 283–90.
23. Amato RJ. Chemotherapy for renal cell carcinoma. Semin Oncol. 2000; 27: 177–86.
24. Thyavihally YB, Mahantshetty U, Chamarajanagar RS, Raibhattanavar SG, Tongaonkar HB. Management of renal cell carcinoma with solitary metastasis. World J Surg Oncol. 2005; 3(1): 48.
25. Swanson DA. Surgery for metastases of renal cell carcinoma. Scand J Surg. 2004; 93: 150–5.
26. Maldazys JD, deKernion JB. Prognostic factors in metastatic renal carcinoma. J Urol. 1986; 136(2): 376–9.
27. Hoffman NE, Gillet MD, Cheville JC. Difference in organ system of distant metastases by mRCC subtypes. J Urol. 2008; 180: 474–7.
28. Kozlowski JM. Management of distant solitary recurrence in the patient with renal cancer. Contralateral kidney and other sites. Urol Clin North Am. 1994; 21(4): 601–24.
29. Fottner A, Szalantzy M, Wirthmann L, Stähler M, Baur-Melnyk A, Jansson V, et al. Bone metastases from renal cell carcinoma: patient survival after surgical treatment. BMC Musculoskelet Disorders. 2010; 11: 145.

**Minija Čerškutė, Marius Kinčius,
Tomas Januškevičius, Saulius Cicėnas, Albertas Ulys**

KRŪTINKAULIO REZEKCIJA DĖL INKSTŲ ŠVIESIŲ LĄSTELIŲ KARCINOMOS METASTAZĖS: ATVEJO PRISTATYMAS IR LITERATŪROS APŽVALGA

Santrauka

Įvadas. Inkstų ląstelių vėžys (RCC) gali metastazuoti, tačiau pavienė RCC metastazė krūtinkaulyje pasitaiko gana retai. Pristatome neįprastą 63 metų vyro atvejį, kai inkstų šviesių ląstelių karcinoma pasireiškė pirmine metastaze krūtinkaulyje.

Tikslai ir metodai. 63 metų vyrui atsirado naujas nedidelis darinys krūtinkaulyje. Atlikta krūtinės ląstos kompiuterinė tomografija (KT) bei darinio biopsija. Patohistologinio tyrimo atsakymas – inkstų šviesių ląstelių karcinomos metastazė krūtinkaulyje. Remiantis vėliau atliktu pilvo KT tyrimu, pacientui buvo patvirtintas kairiojo inksto apatinio poliaus navikas. Pradėtas gydymas Sunitinibu. Pacientas į Nacionalinį vėžio institutą pateko po dviejų gydymo Sunitinibu ciklų nesant pakankamo gydymo atsako bei didėjant navikiniam dariniui krūtinkaulyje. Pirmiausiai atlikta kairiojo inksto rezekcija, o praėjus dviems mėnesiams po šios operacijos – metastazės rezekcija krūtinkaulyje. Krūtinės ląstos sienos rekonstrukcijai naudotas polipropileno tinklelis ir tiesiojo pilvo raumens fragmentas (angl. MS TRAM).

Rezultatai. Pooperacinis laikotarpis po inksto rezekcijos buvo sklandus. Pašalinus metastazę pasireiškė pneumotoraksas, kuris sėkmingai gydytas drenuojant pleuros ertmę. 7-tą pooperacinę parą atsirado kraujavimas viršutiniame virškinamajame trakte, kuris sustabdytas trimis 20 ml 1:10 000 epinefrino injekcijomis. Po operacijos pacientas iš viso stebėtas 30 mėn. – jam buvo atliekamos kontrolinės dviejų pusių krūtinės ląstos rentgenogramos ir pilvo KT – naviko recidyvo požymių nebuvo stebėta nei ankstyvuoju, nei vėlesniu pooperaciniu laikotarpiu.

Išvados. Kai kuriems pacientams radikalus pavienės inksto šviesių ląstelių karcinomos metastazės chirurginis pašalinimas gali pagerinti jų gyvenimo kokybę ir specifinį ligai būdingą išgyvenamumą.

Raktažodžiai: krūtinkaulis, metastazė kauluose, inksto ląstelių vėžys, rezekcija