International Journal of Surgery Case Reports 86 (2021) 106345

Contents lists available at ScienceDirect

International Journal of Surgery Case Reports

journal homepage: www.elsevier.com/locate/ijscr

Case report

Renal cell carcinoma with widespread metastasis in 19 years old young male – A rare case report

Dilasma Ghartimagar [a,*], Manish Kiran Shrestha [b], Arnab Ghosh [a], Ramitha Eshan Ruwanpathirana [c], Sudeep Regmi [a]

[a] Department of Pathology, Manipal College of Medical Sciences, Pokhara, Nepal
[b] Department of Radiology, Charak Memorial Hospital, Pokhara, Nepal
[c] Manipal College of Medical Sciences, Pokhara, Nepal

ARTICLE INFO

Keywords:
Renal cell carcinoma
Clear cell
Lytic lesion
Young adult

ABSTRACT

Introduction and importance: Renal cell carcinoma is the most common malignant tumor of the kidney which occurs more frequently in men and older people than in women and young adults. Renal cell carcinoma is the second most common renal malignancy diagnosed among pediatric and adolescent patients comprising of 2% to 6% of renal cancers.

Case presentation: A 19 years old young adult male came with a history of epigastric and back pain, hematuria and weight loss. Per abdominal examination showed a palpable mass in the epigastric and left hypochondriac region. Radiological imaging showed diffuse infiltration of renal interstitium with multiple hypodense lesions in left kidney, renal vein infiltration, and lytic destruction of vertebral bodies and left superior pubic ramus. Fine needle aspiration cytology and trucut biopsy was taken which confirmed renal cell carcinoma, clear cell type with bone metastasis.

Clinical discussion: Although most renal cell carcinoma is sporadic and relatively uncommon in young adults, the incidence of renal cell carcinoma in this age group has steadily increased. Young adults are less likely to receive diagnosis of renal cell carcinoma incidentally. A few reported pediatric series have shown that renal cell carcinoma is highly aggressive, tends to be invasive, and metastasizes to the lungs and bones.

Conclusion: Young adult with clear cell renal cell carcinoma showing wide spread metastasis is rare. Since, young age is an independent prognostic factor for cancer-specific survival, early diagnosis of the tumor will be beneficial for patients.

1. Introduction

Renal cell carcinoma (RCC) has its peak incidence in sixth decade of life and is rare in children and adolescents [1]. RCC is the second most common renal malignancy diagnosed among pediatric and adolescent patients, accounting for 2% to 6% of renal cancers [2]. The young age group has a lower incidence of clear cell RCC and clinical presentation ranges from indolent to highly aggressive tumor [3]. We report a rare case of clear cell renal cell carcinoma with wide spread metastasis in 19 years old male. This case report has been reported in line with SCARE criteria [4].

2. Patient information

2.1. Demographic status

A 19 years old young adult male of Magar ethnic group from Dhading, Nepal visited medical outpatient department. He was a ninth grade student from a low socio-economic agricultural family.

2.2. Patient presentation

His chief complaint was epigastric and back pain for 1 week, hematuria and streaks of blood in the sputum on and off for 1 year. He also complained of decreased appetite and weight loss for the last 3 months. There was no history of fever, shortness of breathing and cough.

* Corresponding author.
E-mail address: dilasmagharti.magar@manipal.edu.np (D. Ghartimagar).

https://doi.org/10.1016/j.ijscr.2021.106345
Received 23 July 2021; Received in revised form 17 August 2021; Accepted 21 August 2021
Available online 25 August 2021

On examination, his general condition was fair, blood pressure was 120/70 mm of Hg, pulse was 78 beats/min, His chest was clear and cardiovascular system was normal. Per abdominal examination showed a palpable mass in the epigastric and left hypochondriac region which was firm in consistency and non-tender.

2.3. Family and social history

He is a third child of his parents and has seven siblings. There was no history of such abdominal mass or any cancer in his family and first degree relatives. He is non-smoker but a casual drinker. There is no past history of exposure to chemicals or pesticides.

2.4. Laboratory and radiological findings

His routine laboratory investigation revealed hemoglobin of 11.4 g/dL. Complete blood count, coagulation profile, serum electrolyte level and liver function tests were within normal range. Lactate dehydrogenase was markedly increased with 1070 U/L (normal range 100-190 U/L). His HIV, HbsAg and anti HCV tests were nonreactive. Chest radiograph showed widened mediastinum and bilateral hilar enlargement (Fig. 1). Ultrasonography (USG) abdomen and pelvis revealed large, heteroechoic mass replacing the whole of normal left renal parenchyma with several enlarged left para-aortic nodes.

Contrast enhanced computed tomography (CECT) of chest, abdomen and pelvis demonstrated multiple conglomerate mediastinal and hilar nodes (Fig. 2A and B). Few deposits in left lower lobe of lung and bilateral prominent axillary nodes were also identified. CECT also confirmed large heterogeneously enhancing mass lesion replacing the left renal parenchyma with renal vein infiltration (Fig. 3A). Multiple conglomerate celiac and retroperitoneal nodes were also recognized (Fig. 3B) Lytic destruction of D4 and D5 vertebral bodies and left superior pubic ramus (Fig. 4) and right ischium were detected. Suspicion of metastatic renal cell carcinoma was made with differential of lymphoma.

2.5. Diagnostic intervention

Written informed consent was taken. Under all aseptic precautions, USG guided fine needle aspiration cytology (FNAC) from the left renal mass and trucut biopsy from left pubic bone was taken. Check USG displayed no hemorrhage or hematoma.

FNAC revealed highly cellular smears with tumor cells arranged in several clusters, papillaroid pattern, few acinar pattern and scattered

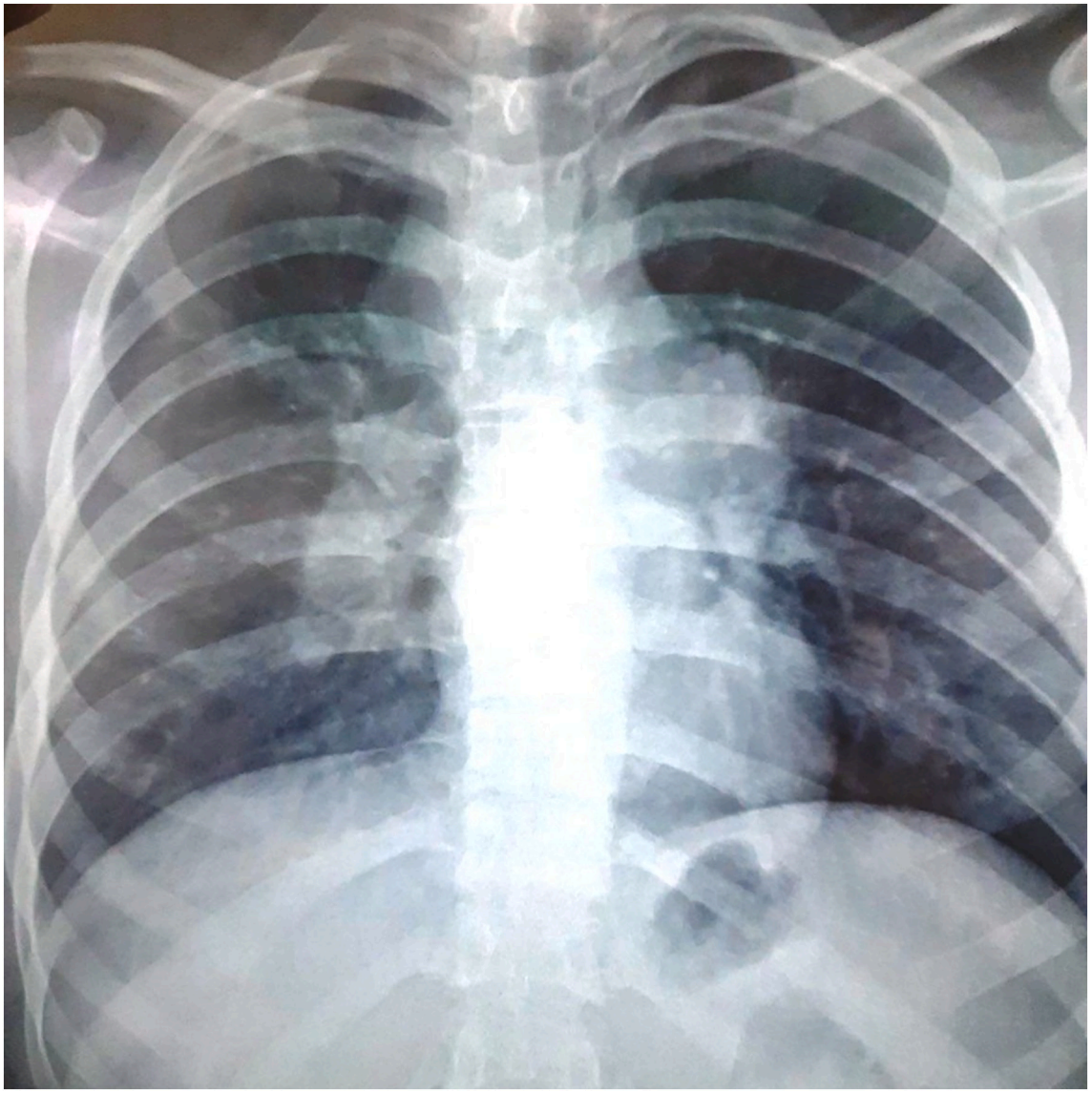

Fig. 1. Chest radiograph showing widened mediastinum.

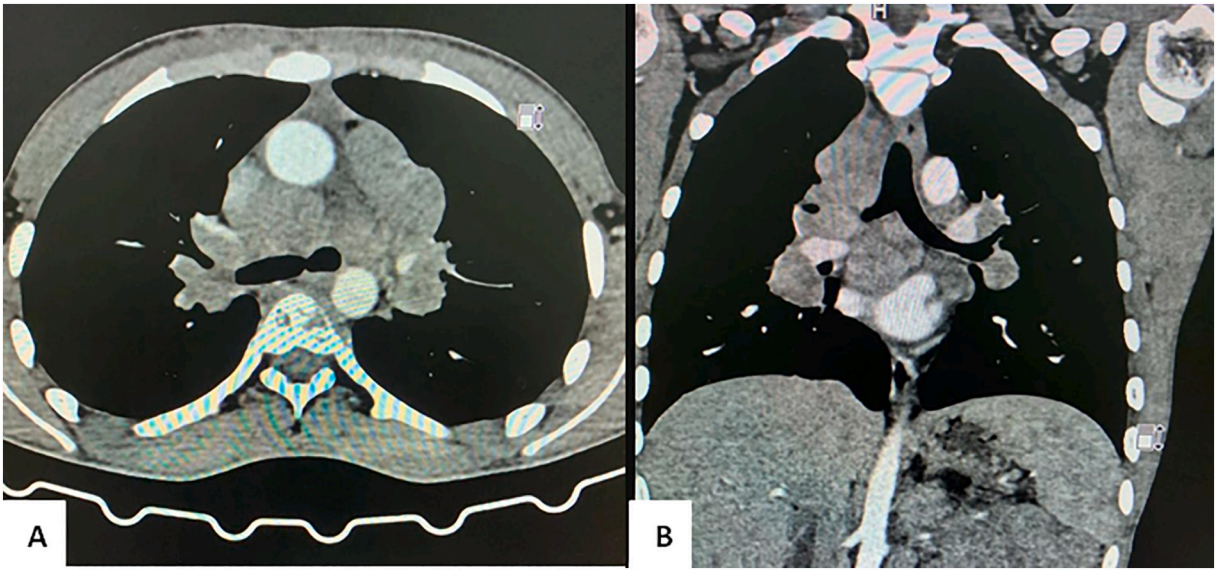

Fig. 2. Axial contrast enhanced CT of chest displaying conglomerate mediastinal and hilar nodes with lytic lesion in vertebral body (A). Coronal reformatted image showing multiple conglomerate mediastinal and hilar nodes (B).

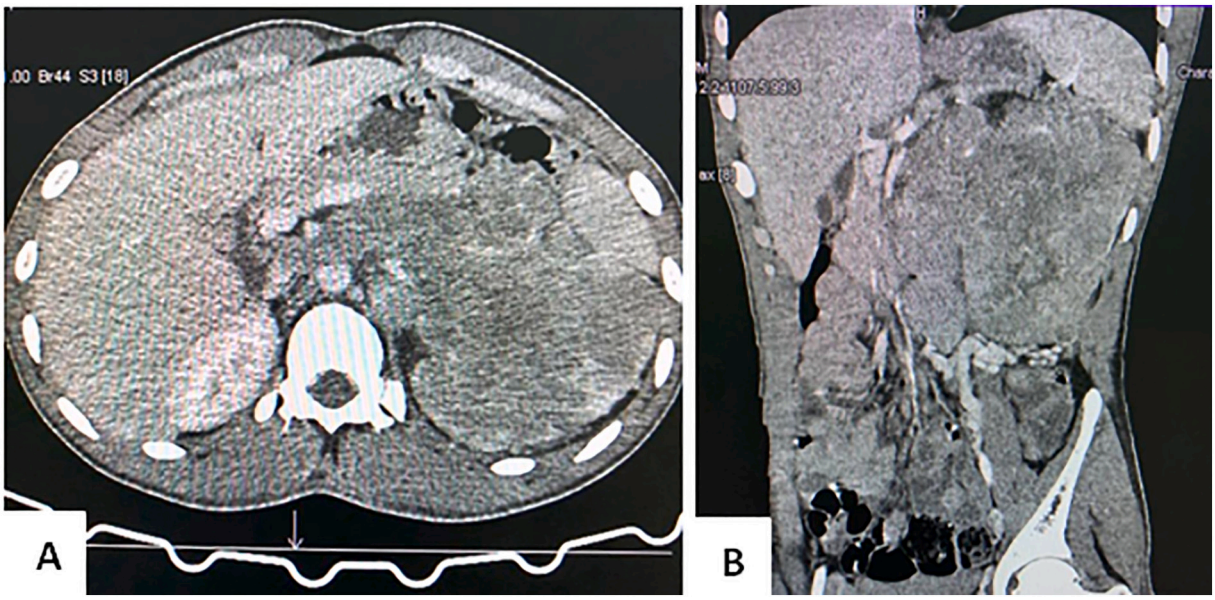

Fig. 3. Axial contrast enhanced CT of abdomen demonstrating large heterogeneously enhancing mass lesion replacing the left renal parenchyma with renal vein infiltration (A). Coronal reformatted image showing left renal mass with multiple conglomerate periaortic nodes (B).

singly. Tumor cells have moderate amount of clear to eosinophilic cytoplasm, pleomorphic centrally placed nuclei with prominent nucleoli (Fig. 5A). Some of the tumor cells showed vacuolated cytoplasm (Fig. 5B). Occasional atypical mitoses were noted. Cytological impression was given as suggestive of renal cell carcinoma and biopsy correlation was advised. Trucut biopsy from the left pubic bone showed the tumor in compact nests and cords separated by thin fibrovascular stroma (Fig. 6). Tumor cells were polygonal in shape with clear to eosinophilic cytoplasm, mildly pleomorphic hyperchromatic nuclei and prominent nucleoli (Fig. 7A). Focal area showed bony spicules (Fig. 7B) surrounded by tumor cells. Histopathological diagnosis from the left pubic bone was given as metastatic renal cell carcinoma, clear cell type.

There were no fresh issues during his hospital stay of 7 days and his vitals were stable. Patient was discharged with painkiller medications for 5 days and was referred to state level cancer hospital.

3. Discussion

Renal cell carcinoma is the most common malignant tumor of the kidney and incidence has been increasing worldwide. RCC occurs more frequently in men and older people than in women and young adults [5]. Renal cell carcinoma is very rare in patients under 21 years of age [1,6]. Although most RCCs are sporadic and relatively uncommon in young adults, the incidence of RCC in this age group has steadily increased during the past several decades [7]. Studies have revealed that clinicopathological characteristics of RCC in young adults may be different from those occurring in the older age group [1,2,7].

The classic triad of symptoms associated with RCC are flank pain, palpable flank mass and hematuria which are present in less than 9% of RCC patients. Approximately one quarter of individuals, at time of presentation, have distant metastases or advanced disease [8]. Young

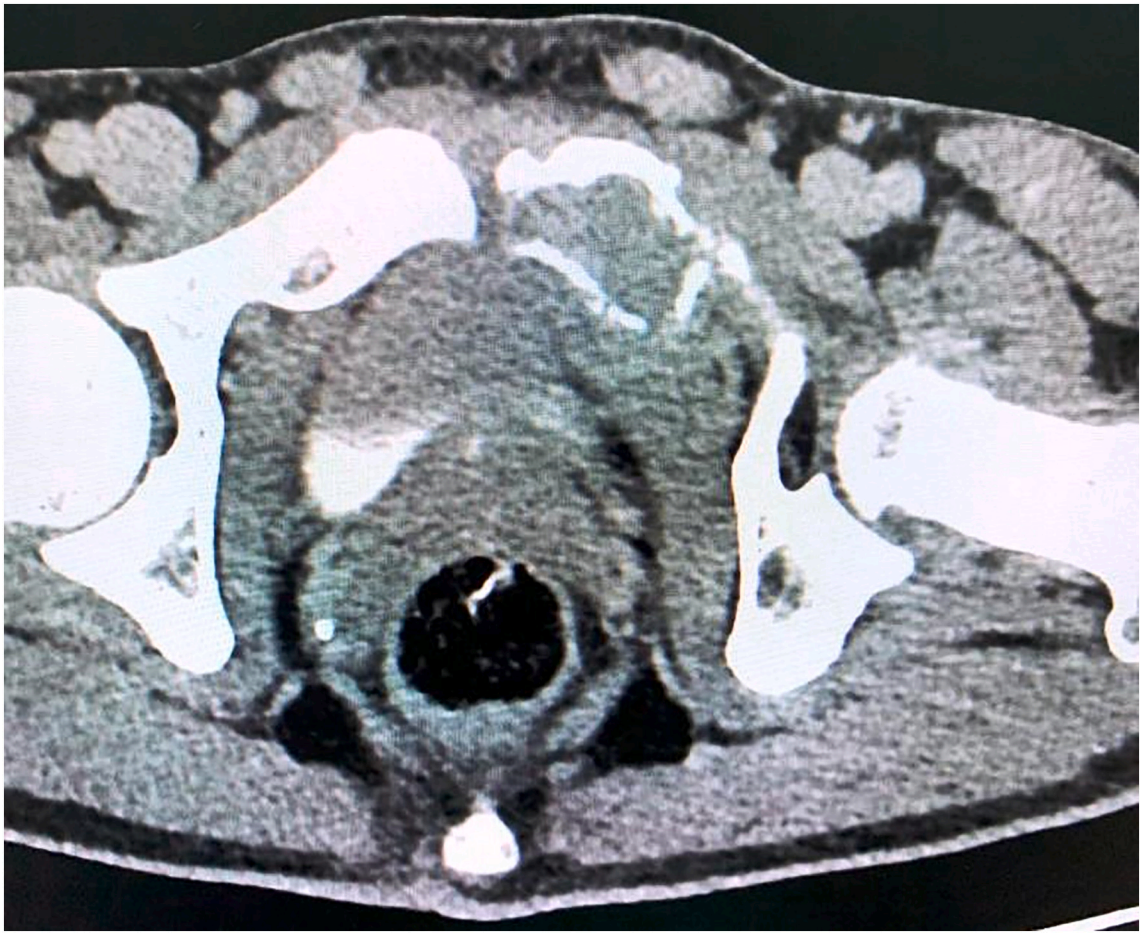

Fig. 4. Lytic expansile lesion in left superior pubic ramus.

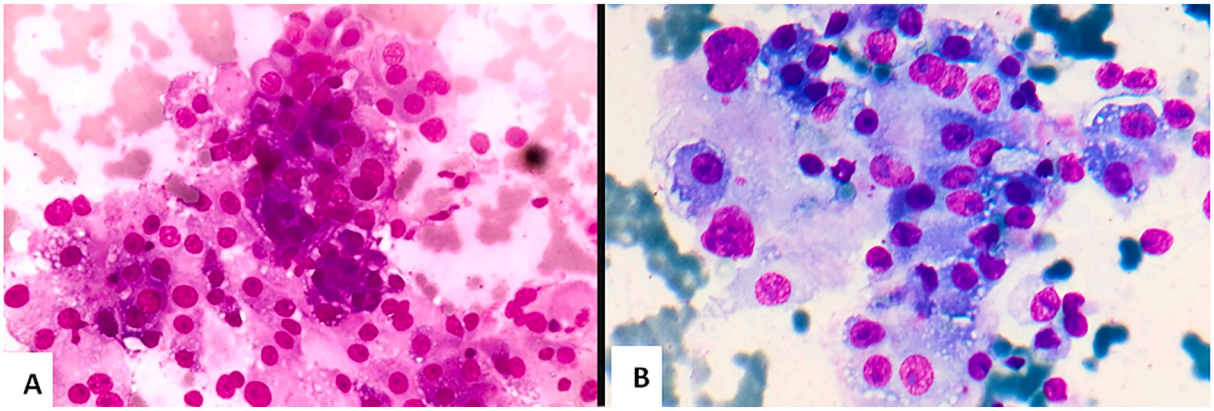

Fig. 5. FNAC picture showing clusters of tumor cells with clear to eosinophilic cytoplasm, vesicular nuclei and centrally placed nucleoli (A) and some of the cells show vacuolated cytoplasm (B). [Giemsa stain, 400×].

adults are less likely to receive diagnosis of RCC incidentally but they are more likely to present with symptoms [8,9]. Despite modern imaging techniques, the rate of symptomatic presentation of tumors in young adults have not decreased which may be due to the fact that younger and generally healthier population rarely come for tumor screening [9]. Aronson DC et al. in their study of RCC in childhood and adolescence reported 22 cases where the age of the patient ranged from 3 to 21 years with a median age of 15.5 years [1]. Suh JH et al. in their single centre study found 44 (5.4%) cases of RCC in young adults below 40 years (range 24-40 years) and the youngest patient had a conventional clear cell RCC [7]. In the present study, patient's age was 19 years.

Young age is associated with higher survival rates and lower progression rate of RCC [9–11]. Tumor outcomes worsen with age, but RCC has a 50%–60% survival rate among pediatric patients. This number rises to approximately 90% when confined to local lymph nodes but falls to 10%–15% when it presents with hematogenous metastasis [12]. Young age RCC is more localized at time of diagnosis, often lower in stage and grade of tumor which leads to a better prognosis when compared to the RCC patient over 40 years of age [8]. A few reported pediatric series have shown that RCC is highly aggressive, tends to be

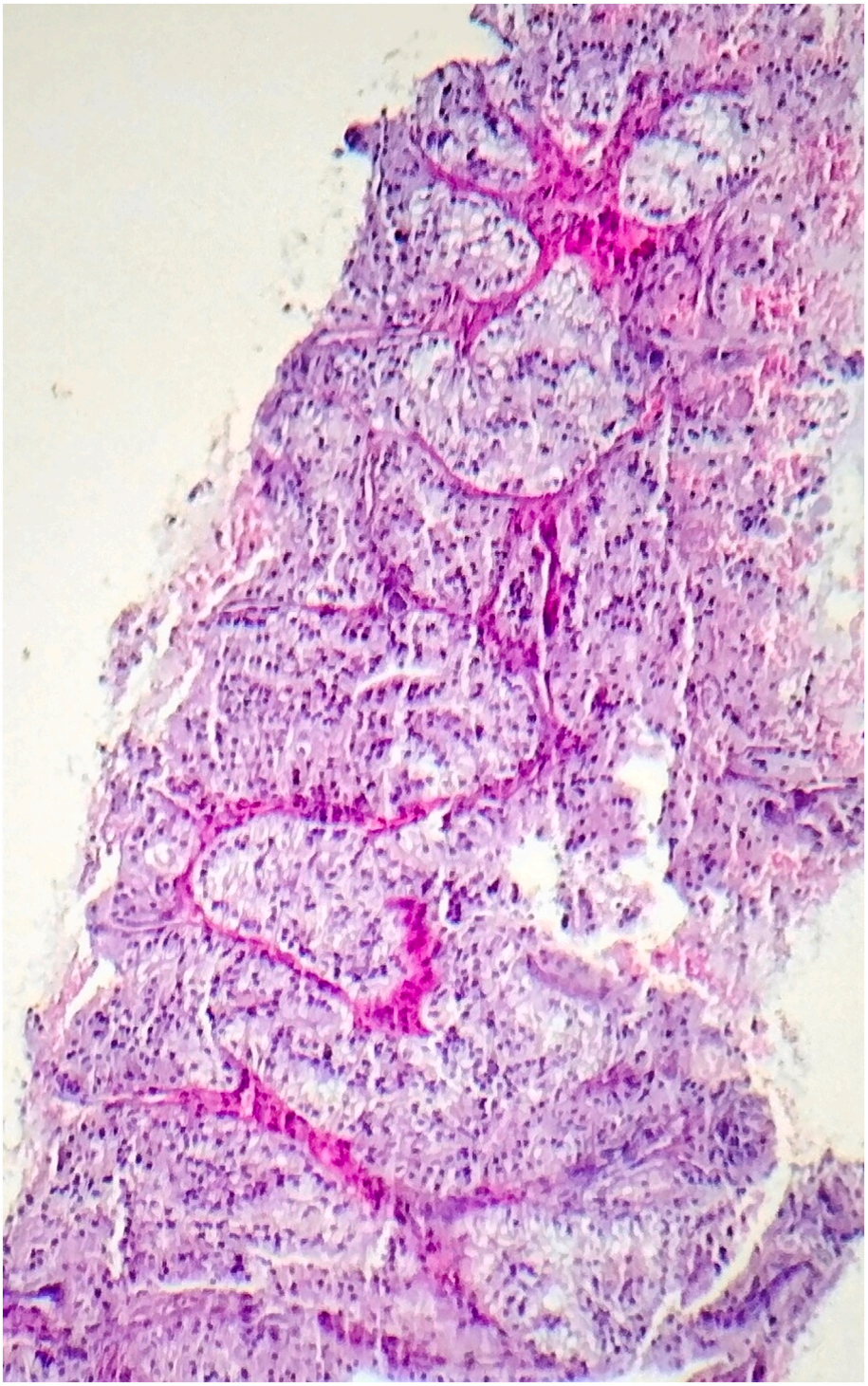

Fig. 6. Histopathological picture of trucut biopsy from left pubic bone showing tumor arranged in compact nests separated by thin fibrovascular stroma. [H&E, 100×].

invasive, and metastasizes to the lungs and bones [1]. Siemer S et al. in their study found RCC with distant metastases in 6.9% cases and lymph node metastases in 12.6% cases while Sanchez-Ortiz RF et al. in their study described higher rate of lymph node metastases i.e.; 25% in young patients [9,11]. In the present case also, there was diffuse mass in left kidney with renal vein infiltration, wide spread lymphadenopathy, left lung and bone metastasis.

There is evidence supporting primary prevention, such as smoking cessation and weight loss which reduces the recurrence of this neoplastic condition. Alcohol avoidance is recommended as this may be a contributing factor for the development of RCC [8]. In our case, the patient was non-smoker but a casual drinker. Many clinical and histological factors, including TNM stage, nuclear grade, histological type, and performance status have prognostic implications for RCC [3]. For clear cell RCC, young age is a favourable prognostic factor and studies have revealed that young age is an independent prognostic factor for cancer-specific survival [3,5].

Early detection of RCC is of paramount importance to achieve

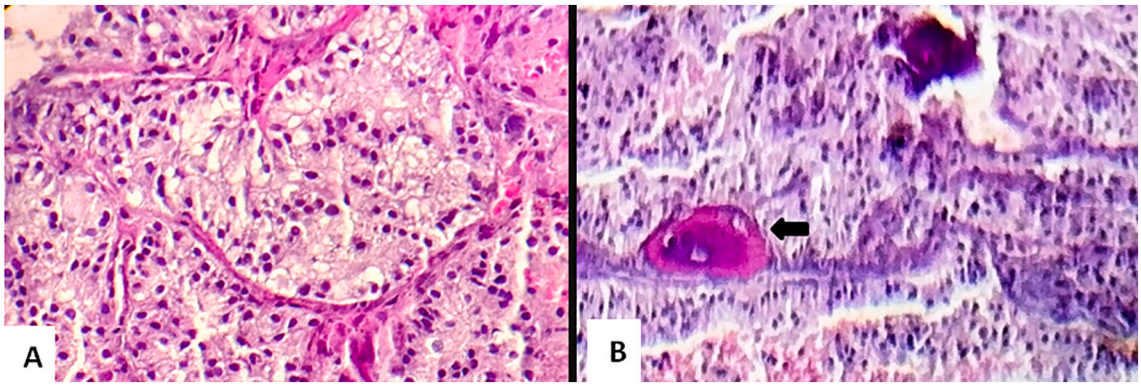

Fig. 7. Histopathological picture showing round to polygonal cells with clear to eosinophilic cytoplasm, mildly pleomorphic nuclei and some showing prominent nucleoli (A) and focal area shows bony (arrow) spicule (B). [H&E, 400×].

successful outcomes and to prevent complications but the challenge is that the early stage of disease often eludes diagnosis until late stages [8,13]. The standard cornerstone of therapy for RCC in children and adolescents is radical nephrectomy [6]. Advances in treatments for metastatic clear cell carcinoma have been made in the last decade with the development of several new targeted agents which have revolutionized the treatment of metastatic clear cell RCC. The management of RCC in adolescents and young adults still remains a challenge for clinicians, but further advances are anticipated as less selective targeted immune-therapies have become more widely available [12].

4. Conclusion

Clear cell renal cell carcinoma with wide spread metastasis is very rare in young adult and they are more likely to present with symptoms despite modern imaging techniques like in the present case. Significant advances in treatments for metastatic clear cell carcinoma have to be made for the proper management of the tumor in adolescents and young adults.

Sources of funding

None.

Ethical approval

Ethical approval for the case report is nonobligatory in our institution.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Authors' contribution

Dilasma Ghartimagar – Study concept, data collection and paper writing.

Manish Kiran Shrestha – Data interpretation, radiological images, paper writing.

Arnab Ghosh – Study design and data analysis.

Ramitha Eshan Ruwanpathirana – Data collection and paper editing.

Sudeep Regmi– Data analysis and paper editing.

Research registration

Not applicable.

Guarantor

Dr. Dilasma Ghartimagar.

Declaration of competing interest

None declared.

References

[1] D.C. Aronson, I. Medary, J.L. Finlay, H.W. Herr, P.R. Exelby, M.P. La Quaglia, Renal cell carcinoma in childhood and adolescence: a retrospective survey for prognostic factors in 22 cases, J. Pediatr. Surg. 31 (1) (1996) 183–186.

[2] J.I. Geller, P.F. Ehrlich, N.G. Cost, G. Khanna, E.A. Mullen, E.J. Gratias, et al., Characterization of adolescent and pediatric renal cell carcinoma: a report from the Children's oncology group study AREN03B2, Cancer 121 (14) (2015) 2457–2464.

[3] H.W. Kang, S.P. Seo, W.T. Kim, S.J. Yun, S.-C. Lee, W.-J. Kim, et al., Impact of young age at diagnosis on survival in patients with surgically treated renal cell carcinoma: a multicenter study, J. Korean Med. Sci. 31 (12) (2016) 1976.

[4] R.A. Agha, T. Franchi, C. Sohrabi, G. Mathew, A. Kerwan, A. Thoma, et al., The SCARE 2020 guideline: updating consensus surgical CAse REport (SCARE) guidelines, Int. J. Surg. 84 (2020) 226–230.

[5] E.-J. Jung, H.J. Lee, C. Kwak, J.H. Ku, K.C. Moon, Young age is independent prognostic factor for cancer-specific survival of low-stage clear cell renal cell carcinoma, Urology 73 (1) (2009) 137–141.

[6] F. Spreafico, P. Collini, M. Terenziani, A. Marchianò, L. Piva, Renal cell carcinoma in children and adolescents, Expert. Rev. Anticancer. Ther. 10 (12) (2010) 1967–1978.

[7] J.H. Suh, T. Oak, J.Y. Ro, L.D. Truong, A.G. Ayala, S.S. Shen, Clinicopathologic features of renal cell carcinoma in young adults: a comparison study with renal cell carcinoma in older patients, Int. J. Clin. Exp. Pathol. 2 (5) (2009) 489.

[8] B.L. Janotha, Symptomatic presentation of renal cell carcinoma in a young adult, Nurse Pract. 34 (6) (2009) 9–11.

[9] S. Siemer, M. Hack, J. Lehmann, F. Becker, M. Stöckle, Outcome of renal tumors in young adults, J. Urol. 175 (4) (2006) 1240–1244.

[10] S. Denzinger, W. Otto, M. Burger, C. Hammerschmied, K. Junker, A. Hartmann, et al., Sporadic renal cell carcinoma in young and elderly patients: are there different clinicopathological features and disease specific survival rates? World J. Surg. Oncol. 5 (1) (2007) 1–7.

[11] R.F. Sanchez-Ortiz, C.J. Rosser, L.T. Madsen, D.A. Swanson, C.G. Wood, Young age is an independent prognostic factor for survival of sporadic renal cell carcinoma, J. Urol. 171 (2004) 2160–2165.

[12] A. Dreisin, M.R. Matrana, Treating renal cell carcinoma in young adults: challenges and solutions, Clin. Oncol. Adolesc. Young Adult. 6 (2016) 31–38.

[13] M. Ramezani, F. Baharzadeh, H. Hadidi, M. Mirzaei, M. Sadeghi, Metastatic renal cell carcinoma to the humerus bone: a report of two cases, Iran J. Blood Cancer. 11 (2) (2019) 69–71.