

## Case Report

# FNA Diagnosis of Cutaneous Metastasis of Renal Cell Carcinoma with Initial Presentation as Scalp Lesion

Susanna Syriac\*, Sonja Boergert and Santhi Ganesan

Department of Pathology, Case Western Reserve University, USA

## \*Corresponding author

Susanna Syriac, Department of Pathology, Case Western Reserve University, 13008 Hampton Club Drive, Apt 207, North Royalton, Ohio, USA, Tel: 0017164082084; Email: suzycyriac@hotmail.com

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## Keywords

- Renal Cell Carcinoma
- Metastasis
- Cutaneous
- Histiocytoid

## Abstract

Renal cell carcinoma initially presenting as cutaneous metastasis is uncommon. We report a case of a 73 year old female with a raised, hemorrhagic, scalp lesion and no known history of malignancy. Fine needle aspiration (FNA) of the scalp lesion showed histiocytoid cells arranged singly and in groups. Immuno histochemical work up and cyto morphological features favored a diagnosis of metastatic renal cell carcinoma. CT scan of abdomen revealed a left renal mass suspicious for renal cell carcinoma. Minimally invasive procedure like FNA is helpful in the diagnosis of cutaneous metastasis of unknown primary by avoiding more invasive methods.

## ABBREVIATIONS

RCC: Renal Cell Carcinoma; FNA: Fine Needle Aspiration

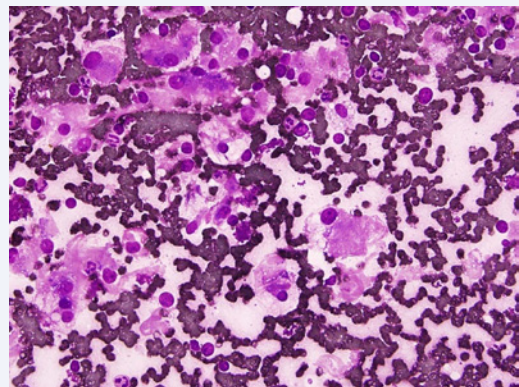
## INTRODUCTION

Renal cell carcinoma (RCC) can metastasize to nearly every organ, the most common being lung, bone, lymph nodes, adrenals, brain, liver, and contra lateral kidney [1]. In about 30% of cases, the patients have metastatic disease on initial presentation [2]. Cutaneous metastasis of RCC is rare. The scalp has been reported to be the common site for cutaneous metastasis of RCC followed by chest and abdomen [3]. Fine Needle Aspiration Cytology (FNAC) is an excellent method for early diagnosis of subcutaneous nodules, which in the presence of characteristic cytomorphology obviates the need for more invasive methods and surgery [4].

## CASE PRESENTATION

The patient is a 73 year old female who presented with fatigue and confusion and was found to have severe metabolic acidosis. There is no documented significant past medical history as she never consulted a doctor. She was incubated and treated for her medical condition. She also reported a 50 pound weight loss in 6 months and history of fall on her face two days prior to the admission. A scalp lesion was noted in the right parietal region, which the patient attributed to a history of trauma a year ago. CT scan of head showed generalized atrophy without acute intracranial injury, and nasal bone fracture. The scalp lesion was suggested to be sebaceous cyst, post injury granuloma or other benign lesion. CT chest showed bilateral multiple pulmonary nodules, suspicious for metastatic carcinoma.

The scalp lesion was a raised, non-pulsating, red tan nodule measuring 3 x 3 x 1.5 cm. A fine needle aspiration was performed using 22 gauge needle with two passes. The lesion was hemorrhagic. Two air-dried slides stained with Diff-Quik and two spray-fixed slides stained with Papanicolaou stain were prepared. A cell block was also prepared from the material collected in the cytolyte solution. The Diff-Quik stained slides showed histiocytoid cells arranged singly and in groups (Figure 1, 2). The cells had abundant vacuolated cytoplasm, low nuclear cytoplasmic ratio, and conspicuous nucleoli (Figure 3). Occasional giant multi nucleated cells and few groups of cells with fibrovascular cores were also present. The differential diagnosis



**Figure 1** 40 xs. Diff-Quik stain showing histiocytoid cells arranged singly. The cells have abundant vacuolated cytoplasm with low nuclear cytoplasmic ratio, and conspicuous nucleoli.

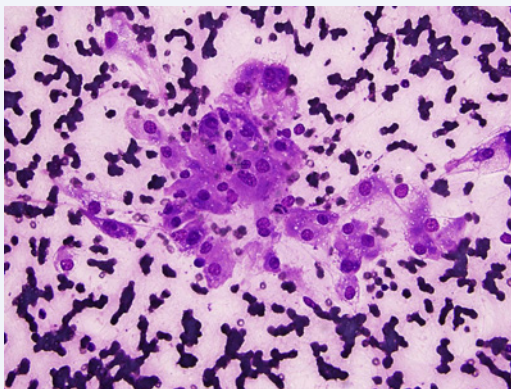
based on cyto morphological features included fibrohistiocytic lesions of skin and subcutaneous tissue, metastatic renal cell carcinoma and skin adnexal tumors with clear cell features, such as sebaceous carcinoma.

Immunohistochemical work up was performed on the cell block using antibodies CD10 (Figure 4), RCC marker, EMA, S100, Melan-A, and PAX-8. The tumor cells were positive for CD10, focally positive for RCC marker and rare cells strongly positive for EMA. The tumor cells were negative for S100 and Melan-A. PAX-8 stain was noncontributory.

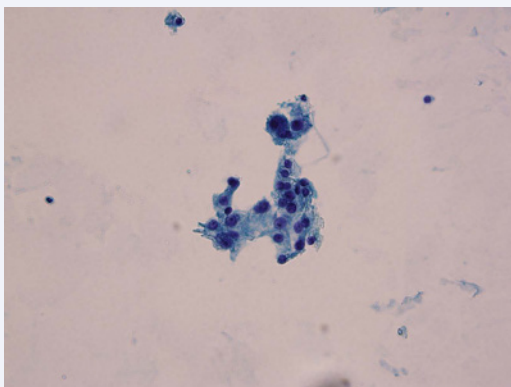
The overall cytomorphological and immunohistochemical features favored a diagnosis of metastatic renal cell carcinoma. Later, CT abdomen and pelvis revealed an exophytic left renal mass measuring 8.6 cm, suspicious for renal cell carcinoma and bland thrombus in the left renal vein. Cytreductive nephrectomy and plastic surgery for the scalp lesion were recommended for the patient. Patient declined any treatment.

## DISCUSSION

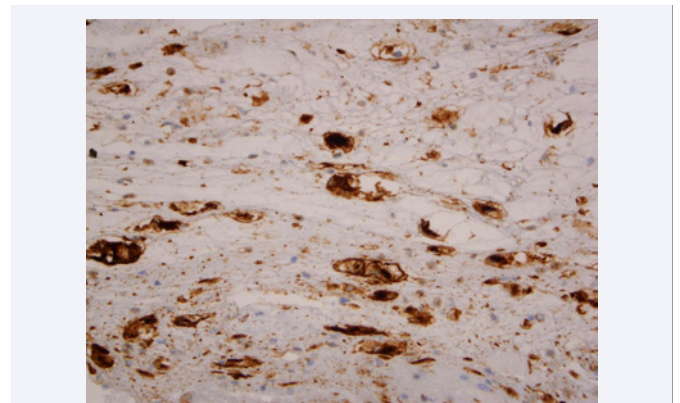
Cutaneous metastasis of RCC usually present as rapidly growing solitary lesions, bluish-red in color and sometimes pulsating [5]. Initial presentation of RCC as cutaneous metastasis



**Figure 2** 40 xs. Diff-Quik stain showing histiocytoid cells arranged in groups. The cells have abundant vacuolated cytoplasm with low nuclear cytoplasmic ratio, and conspicuous nucleoli.



**Figure 3** 40 xs. Pap stain showing histiocytoid cells arranged in groups. The cells have abundant vacuolated cytoplasm with low nuclear cytoplasmic ratio, and conspicuous nucleoli.



**Figure 4** 40 xs. Cell block showing tumor cells positive for CD10.

is uncommon. Our case of RCC presented initially with cutaneous metastasis to the scalp as a red-tan, non-pulsating lesion. In such cases, the diagnosis of RCC by a minimally invasive procedure such as FNAC can be helpful in avoiding invasive methods and surgery. Although punch biopsy is also considered minimally invasive, FNAC may be a better option in hemorrhagic lesions. Punch biopsy requires local anesthesia with slightly more chance of bleeding and infection compared to FNAC. Punch biopsy has the advantage of preserved architecture and obtaining more tissue for immunohistochemical studies. However, if specimen adequacy by fast stain is not performed, it may sometimes result in inadequate sampling. FNAC has the benefit of several passes and movements in different directions to ensure adequate sampling.

The cytomorphological features of metastatic RCC include histiocytoid cells arranged singly or in groups. The cells show low nuclear cytoplasmic ratio with abundant vacuolated cytoplasm. Nucleoli may be prominent depending on the Fuhrman grade of the tumor. The tumor cells may be admixed with small capillaries recapitulating the vascular septa separating the nests of tumor cells.

The differential diagnosis of cutaneous metastasis of RCC include fibrohistiocytic lesions of skin and subcutaneous tissue with foamy histiocytes or histiocyte-like cells, such as xanthomatous dermatofibroma, malignant fibrous histiocytoma / atypical fibroxanthoma, plexiform fibrohistiocytic tumor, and clear cell lesions such as xanthomas, xanthelasma, xanthogranulomas, balloon cell nevi, clear cell hidradenomas, and granular cell tumor. The differential diagnosis also includes skin adnexal tumors especially sebaceous neoplasms including sebaceous hyperplasia, sebaceous adenoma and carcinoma. Others include malignant histiocytosis of skin which shows large pleomorphic epithelioid cells with foamy cytoplasm and clear cell neoplasms like clear cell sarcoma, clear cell acanthoma, clear cell syringoma, and clear cell porocarcinoma.

Identification of "histiocytoid" morphology is the key in formulating the differential diagnosis. Furthermore, observation of small clusters of histiocytoid cells with interspersed capillaries is important. In cases without prior diagnosis of renal malignancy, high index of suspicion is needed to further identify the histiocytoid cells as neoplastic rather than cyst contents as

the component cells of clear cell renal cell carcinoma can be deceptively bland, especially when seen out of context.

Immuno histochemistry study is essential to differentiate the malignant cells of metastatic RCC in subcutaneous tissue from the histiocytoid skin lesions and sebaceous neoplasms, especially when the primary is unknown. Renal cell markers such as RCC ma, CD10, EMA, and PAX 8 can help in identifying metastatic renal cell carcinoma. RCC ma is a very valuable component of a panel of immunohistochemical markers when evaluating cutaneous clear cell lesions [6]. Histiocytic markers such as CD68 and lysozyme can be useful in distinguishing the fibrohistiocytic lesions and certain specific markers for some of these lesions like CD34 and Factor XIIIa for dermatofibroma. Sebaceous carcinoma stains positive with keratin and EMA. Clear cell sarcoma stains for S100, HMB-45 and Melan-A.

It has been reported that the development of skin metastasis usually occur within six months to five years after initial diagnosis and after nephrectomy [7]. In our case, cutaneous metastasis was the initial presentation of renal cell carcinoma. There are few case reports of initial presentation of renal cell carcinoma as cutaneous metastasis [8, 9]. Cutaneous metastasis of renal cell carcinoma as initial presentation can be accurately diagnosed by fine needle aspiration which is minimally invasive, fast and cost effective even in cases of unknown primary and thus guide the clinician to further work up the patient.

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