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METASTATIC CLEAR CELL RENAL CELL CARCINOMA TO THE SUBCUTANEOUS AREA IN ILLIAC FOSSA AND ADRENAL GLAND WITHOUT AN IDENTIFIABLE PRIMARY TUMOR

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ABSTRACT

Motion control incorporates a range of challenges when it comes to the control of mechanical systems. In rotary motion; position, velocity and acceleration control are the tasks required most often for robotics. The achievement of velocity control is one of the popular technical issues in motion control and industrial applications. The traditional approach for velocity control is PID based feedback controllers. PID controllers are not suitable for the applications subjected to higher external disturbances. This paper proposes a Disturbance Observer (DOB) based velocity controller. DOB together with the tuned PID controller can make the system robust. To validate the proposed method, stability analysis and experiments were carried out with and without DOB. The velocity responses of the experiments were analyzed for different modes of disturbances with different observer gains. The performance of the proposed controller shows enhanced results compared to the traditional velocity controllers.

KEYWORDS : Renal Cell Carcinoma (RCC)

Spontaneous regression of primary RCC is poorly defined, encompassing pathological and radiological descriptions. In pathological specimens, all prior cases had areas of viable tumor (Choi et al., 1986; Edwards et al., 1996; Hamid and Poller, 1998). RCC is well known for its ability to metastasize to nearly every organ system of the body. Metastasis usually occurs several years after identification of the renal primary, but up to 30% of patients have metastatic disease on initial presentation. The most common targets for metastases are lung, bone, lymph nodes, adrenal glands, brain, liver, and contralateral kidney In contrast, pancreatic and cutaneous involvement is exceedingly rare, occurring approximately 0.25-3% and 3.3% of the time, respectively(Matthew et al., 2012). Men are affected more than women and metastatic disease at presentation occurs in up to one third of patients.There has been one case of metastatic RCC diagnosed without an identifiable primary in which primary tumor was observed 4 months later (Matthew et al., 2012). Choi reported a nephrectomy with minimal viable tumor, described as "clusters of tubular structures of varying sizes," but carried out no ancillary studies (Choi et al., 1986).

CASE HISTORY

A 50 year old male presented in surgery department with a painful subcutaneous mass in left iliac fossa since 6 months. Biopsy was done from the swelling and sent to our histopathology department. The clinical diagnosis was Fibroma.

Histopathological Findings

Gross

A grey white, soft to firm, irregular tissue piece measuring 1.5 cm.

Microscopic Findings

H & E stained sections studied showed malignant tumor cells arranged in tubules; cords; trabeculae; nests & sheets separated by fibrous septa invading the surrounding skeletal and fibrocollagenous tissue. The individual tumor cells were round to oval with moderate amount of eosinophilic cytoplasm. The cytoplasm was vacuolated in few areas (clear cells), bearing pleomorphic, vesicular nuclei with prominent nucleoli. (figure 1). The tumor showed brisk mitotic activity (7-8/10 hpf)

Immunohistochemistry (IHC) was done

EMA &CK (carcinoma markers) were positiveand Vimentin; S-100, Desmin (sarcoma markers) was negative.

So, the diagnosis of Metastatic malignant epithelial tumour was given based on H & E and IHC markers

The patient underwent CT scan for the search of primary malignancy which showed heterogeneously enhancing well defined lesion in left supra renal region.

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CT- findings were suggestive of left adrenal mass? primary malignancy/ metastasis.

Later, the patient was referred to Urology department. He underwent surgery and adrenalectomy was done and sent for histopathological examination:

Gross findings-Well circumscribed capsular globoid mass measuring 8x7.5x5 cm,{Figure 4 (a)}which was hard in consistency. Cut section was yellowish-white with vague nodular morphology.

Microscopic Findings

H&E stained sections showed fibrous capsule underneath which were seen tumor cells arranged in nests, organoid, trabecular and papillary pattern. Individual tumor cells were round to polygonal in shape having clear cytoplasm, showing marked nuclear pleomorphism with atypical mitotic figures. Large areas of geographic necrosis were seen. Morphological features similar to subcutaneous mass. Infiltration of tumor cells into capsule was seen. Adrenal gland was infiltrated by the tumor (figure 2). Panel of IHC markers were done.

Immuno Profile or Immunostain

Pancytokeratin ; CK 7 ; EMA were positive & CD 10 was strongly positive (figure 3). Chromogranin; Inhibin; Melan-A; Thyroglobulin & TTF-1were negative ,correlating strongly with RCC of clear cell type. Based on H&E and IHC studied final pathological diagnosis of Metastasis of Renal cell carcinoma (clear cell type) to adrenal gland was given.

The patient was closely followed in an attempt to locate a primary renal source of disease with multiple imaging studies which were negative for a renal primary or other sites of metastasis.

Four months later we received the left nephrectomy specimen for histopathological examination ; which showed extensive areas of renal scarring and fibrosis(figure 4 b) with changes of chronic pyelonephritis (CPN) with no identifiable primary tumor searched extensively on microscopy.

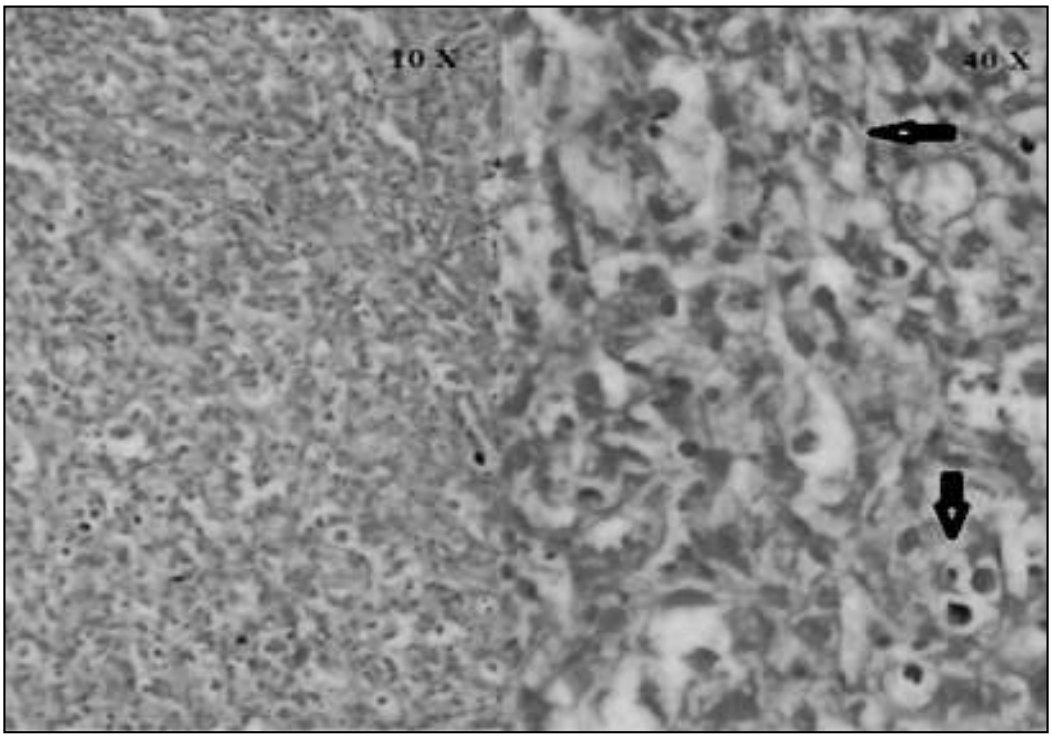

Figure 1 : Microphotograph of Haematoxylin & Eosin (H&E) Stained Low Power (10 X) and High Power (40 X) Sections Showing Tumor Cells Having Clear Cytoplasm(Clear Cell Type of RCC)

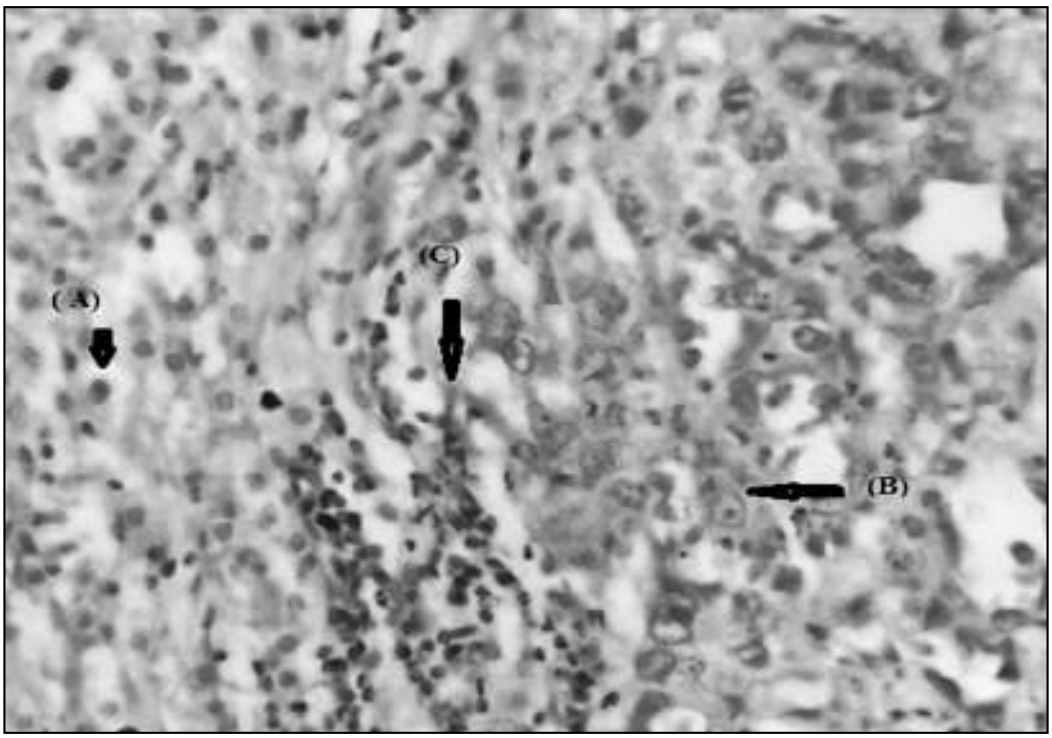

Figure 2 : Microphotograph of Haematoxylin & Eosin (H & E) Stained Section (40x) Showing (a) Normal Adrenal Glands (b) Tumor Cells Infiltrating Adrenal Glands (c) Tumor Infiltrating Lymphocytes

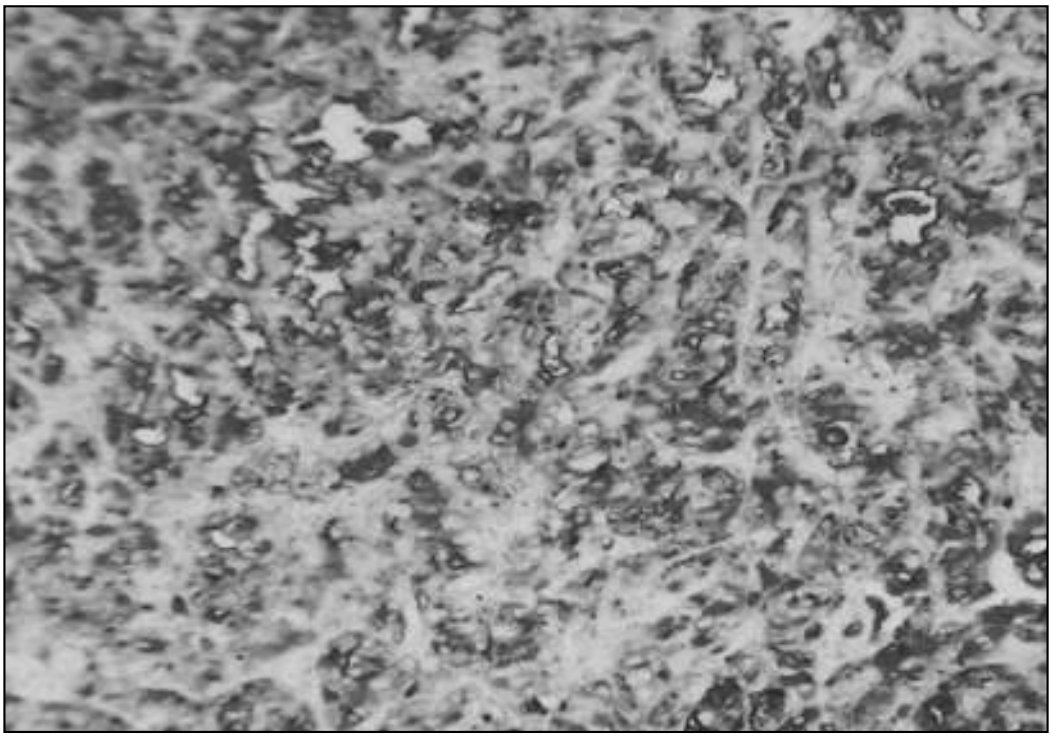

Figure 3 : Microphotograph of Immunostaining CD10 Showing Positivity of Tumor Cells (Characteristic of RCC)

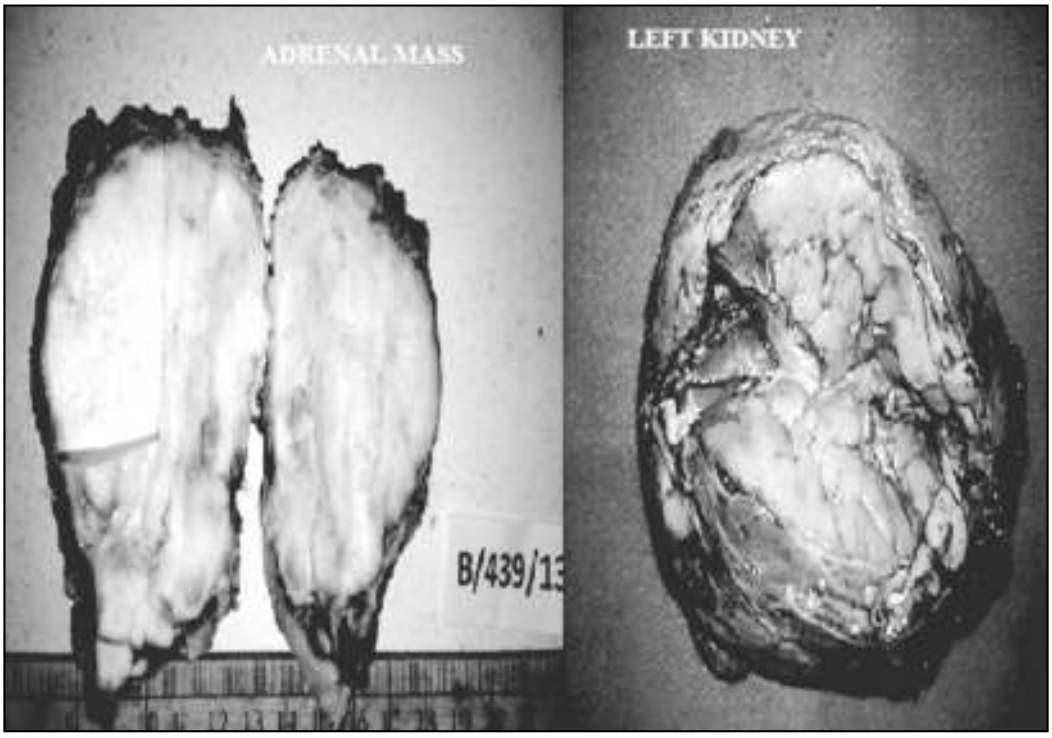

Figure 4 : Microphotograph of Gross Specimen (a) Tumor Mass in Left Adrenal (b) Left Kidney-Grossly Free of Tumor

DISCUSSION

Metastasis of renal cell carcinoma can occur to virtually any organ, and involvement of multiple organs is not uncommon. To date, no reports have been found of metastatic disease without a renal primary (Wayne et al., 2010). We present a case of renal cell cancer initially presenting as a subcutaneous mass in the left iliac fossa with left adrenal metastases in absence of a primary renal source. It occurs predominantly in males in their sixth to eight decade of life, and African Americans have a 10-20% higher incidence (Wayne et al., 2010).

RCC is well known for its ability to metastasize to nearly every organ system of the body. Metastasis usually occurs several years after identification of the renal primary, but up to 30% of patients have metastatic disease on initial presentation .The most common targets for metastases are lung, bone, lymph nodes, adrenal glands, brain, liver, and contralateral kidney (Wayne et al., 2010).The nature of this tumor distinguishes itself from other cancers in several respects. Namely, it's peculiar ability to metastasize to nearly every region of the body several years after initial presentation. It also differs from other neoplasms in its predilection for both hematogenous and lymphatic spread.We present this case of two metastatic RCC to adrenal gland and subcutaneous mass in left iliac fossa without the identification of a renal primary. However, metastasis from RCC to the skin is much less common (Tunio et al., 2010). It is usually a sign of poor prognosis (Aridogan et al., 2004). The architectural growth patterns of clear cell RCC can vary, ranging from sinusoidal and sheet-like solid patterns to alveolar, tubular, or acinar appearances. It is unknown if the presence of viable tumor is acceptable to denote a designation of regression or how much viable tumor is permissible. In radiologically-defined regression, a renal mass remained in all serial photographs (Edwards et al., 1996; Kobayashi et al., 2002).

It is unclear what amount of size reduction qualifies as regression. The mechanism of spontaneous regression is unknown, although it is likely to be multifactorial involving immune and non-immune factors. Spontaneous regression in melanoma has been associated with multiple primary tumors and increased T-lymphocytes

in the regressed specimens. Thymoma can show spontaneous regression as a result of infarction. Similar phenomenacan occur in the kidney1.Immunohistochemical studies are helpful to distinguish metastatic from primary adrenaltumors.Examination of the adrenal tissue and subcutaneous biopsy revealed a focal, microscopic cluster of malignant cell consistent with renal cell carcinoma. Immunostaining with CD 10 confirmed malignant RCC. In our case after thorough search, no primary tumor in kidney was found ,so we proposed that primary tumor in kidney has undergone spontaneous regression ,leaving behind scar tissue.However, the patient is under surveillance in case of emergence of primary tumor in contralateral kidney.

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