**Case Scenario 1**

**HISTORY & PHYSICAL**

ADMIT: 03/17/16

CHIEF COMPLAINT: Intractable back pain.

HISTORY OF PRESENT ILLNESS: This 74 year old white female has a long standing history of severe lumbosacral as well as cervical spine disease. The lumbar spine was diagnosed as being spinal stenosis. She's had persistent weakness and inability to walk that has progressed over the last few years since her surgery in 2011; patient is now completely bed and wheelchair confined. She was found on her workup to have no fractures of her lumbosacral CT scan but the CT scan of the abdomen and pelvis showed a right renal mass and renal ultrasound suggested this was a solid mass. Repeat CT scan with contrast p.o. and IV showed a right renal mass with features very suggestive of renal cell carcinoma. The patient also had a retrobulbar ulcer and Helicobacter Pylori titer was negative and so we were reluctant to treat the ulcer with just Protonix alone. The back pain was treated initially with IV Dilaudid as well as Fentanyl Patch 12 meg and the patient had a hypotensive response to these new narcotics so we stopped the IV Dilaudid.

FAMILY HISTORY: Positive for both parents dying of lung cancer. She had a brother that died of MI. She had a sister that died of breast cancer. She's one of seven children.

**STUDY: RENAL SONOGRAM**

HISTORY: Renal lesion seen on previous CT, presents for further evaluation.

FINDINGS: Comparison is made to exam dated 03/25/16.

The right kidney measures 9.3 cm in length and the left kidney measures 8.5 cm in length. The renal cortical echogenicity is normal. There is a solid-appearing iso-to slightly hypoechoic nodule along the lateral cortex of the right kidney which measures 7.5 x 8.0 CM in diameter. Vascular flow is not definitively identified within this lesion.

There is no evidence of calculus. The bladder is normal.

IMPRESSION: Solid lesion arising from the lateral mid cortex of the right kidney measuring up to 8.0 cm. Further evaluation with MRI is recommended or renal CT to exclude malignancy.

**STUDY: COMPUTED TOMOGRAPHY OF THE ABDOMEN AND PELVIS WITH CONTRAST COMPLETE: 03/25/16**

HISTORY: Abdominal and back pain. Remote history of hysterectomy.

Findings: Abdomen sections are obtained to the pelvic brim followed by pelvic sections through the pubic symphysis after 80 ml intravenous Omnipaque 350. Minimal bilateral dependent lower lobe atelectasis, calcified splenic granulomas, normal gallbladder diameter and wall thickness, L4-5 fusion, and mild atherosclerotic disease are

observed. A heterogeneous enhancing 7.5 x 8.0 CM right lateral interpolar renal neoplasm is observed.

A 2.2 x 2.4 cm post bulbar duodenal ulcer is observed with associated duodenal mural thickening and minimal surrounding inflammation. There is no evidence of extraluminal gas or fluid collection. The liver, pancreas, adrenals, and left kidney are within normal limits. Bowel loops exhibit normal caliber and wall thickness. Several descending colon diverticula are present. Pelvic sections reveal hysterectomy and possibly appendectomy. The urinary bladder is

unremarkable. A few sigmoid diverticula are present without diverticulitis.

SUMMARY:

1. 2.4 cm post bulbar duodenal ulcer.

2. 7.5 x 8.0 CM right lateral renal neoplasm, most likely renal cell carcinoma. There is no evidence of metastatic adenopathy or renal sinus invasion.

**STUDY: CT abdomen before and after IV contrast dated 03/27/16**

HISTORY: 74-year-old female with history of right renal mass.

TECHNIQUE: 3 mm axial sections were performed through the abdomen from the dome of the diaphragms to the aortic bifurcation. The study was performed after the uneventful intravenous injection of 80 cc of Omnipaque 350. The BUN was 15. The creatinine was 0.8. Estimated GFR was 75 mL/min.

FINDINGS: Small bilateral pleural effusions were noted. No hepatomegaly, focal hepatic mass or dilated hepatic biliary ducts were noted. A few small gallstones were noted. No pericholecystic inflammation or gallbladder wall thickening was noted. No adrenal mass was identified. No pancreatic mass, pseudocyst or pancreatic duct dilatation were identified. No splenomegaly or focal splenic mass was seen. Multiple calcified splenic granulomas were noted. An unchanged: 7.5 x 8.0 CM mass was noted off the mid lateral aspect of the right kidney. No left renal mass was identified. No hydronephrosis or cortical scarring was seen. No periaortic, pericaval or retrocrural lymphadenopathy was noted. No colitis or diverticulitis was noted. Postoperative changes were noted from prior laminectomies at the L4-5 disk.

**Medical Oncology**

4/12/16-The patient was started on preoperative Votrient on 4/01/16. Chemotherapy will continue after surgery.

**Operative Report**

6/19/16 Left laparoscopic conversion to open radical nephrectomy

**Pathology Report**

Final Diagnosis:

Specimen: right kidney and adrenal gland, right, radical nephrectomy.

Histologic Tumor Type: renal cell carcinoma

Histologic Tumor Grade: Fuhrman Nuclear Grade II confined by Gerota’s fascia

Tumor Size: 6.0 x 6.5 CM.

Extent of Tumor: Upon pathological examination, the mass proved to be a clear cell carcinoma involving the renal capsule, and renal parenchyma and large blood vessels.

Hilar nodes – No metastasis.

Hilar blood vessels – No tumor involvement.

Ureter – No tumor involvement.

Adrenal – No tumor involvement.

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| * **What is the primary site?**   **C649**   * **What is the histology?**   **8310/3 - Clear Cell Carcinoma** | | | | * **What is the grade/differentiation?**   **9-unknown** | | |
| **Stage/ Prognostic Factors** | | | | | | |
| Summary Stage | 2-Reg by DE | |  | |  | |
| TNM Clin T | c2a | | TNM Path T | | p3 | |
| TNM Clin N | c0 | | TNM Path N | | p0 | |
| TNM Clin M | c0 | | TNM Path M | | c0 | |
| TNM Clin Stage | II | | TNM Path Stage | | III | |
| TNM Clin Descriptor | 0 | | TNM Path Descriptor | | 4 | |
| TNM Clin Staged By | 20 | | TNM Path Staged By | | 20 | |
|  |  | |  | |  | |
| Tumor Size Summary | 080 | | Mets at Dx - Bone | | 0 | |
| Regional Nodes Examined | 98 | | Mets at Dx - Brain | | 0 | |
| Regional Nodes Positive | 00 | | Mets at Dx - Liver | | 0 | |
| CS SSF 1 | 991 | | Mets at Dx - Lung | | 0 | |
| CS SSF 2 | 000 | | Mets at Dx - Other | | 0 | |
| CS SSF 3 | 000 | | Mets at Dx – Distant LN | | 0 | |
| CS SSF 4 | 000 | |  | |  | |
| CS SSF 6 | 999 | |  | |  | |
| CS SSF 8 | 000 | |  | |  | |
| **Treatment** | | | | | | |
| Diagnostic Staging Procedure | | 00 |  | | |  |
| **Surgery Codes** | |  | **Radiation Codes** | | |  |
| Surgical Procedure of Primary Site | | 50 | Radiation Treatment Volume | | | 00 |
| Scope of Regional Lymph Node Surgery | | 3 | Regional Treatment Modality | | | 00 |
| Surgical Procedure/ Other Site | | 0 | Regional Dose | | | 00000 |
| **Systemic Therapy Codes** | |  | Boost Treatment Modality | | | 00 |
| Chemotherapy | | 02 | Boost Dose | | | 00000 |
| Hormone Therapy | | 00 | Number of Treatments to Volume | | | 000 |
| Immunotherapy | | 00 | Reason No Radiation | | | 1 |
| Hematologic Transplant/Endocrine Procedure | | 00 | Radiation/Surgery Sequence | | | 0 |
| Systemic/Surgery Sequence | | 2 |  | | |  |

**Case Scenario 2**

**History:** A 43-year-old Asian male presented with a three-month history of fever, non-productive cough and weight loss. He was a chronic smoker and had no significant medical history. Results of a physical examination were unremarkable. A chest radiograph revealed a large right lower zone lung lesion, and a subsequent computed tomography (CT) scan of the thorax and abdomen revealed a large heterogeneously enhancing soft tissue mass in the right lower lobe of the lung with intra-cavitary extension into the left atrium via the right inferior pulmonary vein. Transthoracic needle aspiration of this mass was suggestive of carcinoma. Surgery was performed for the resection of this mass; a right posterior lateral thoracotomy was performed, followed by a right lower lobectomy. The left atrium was opened at the inferior part of the superior pulmonary vein and the tumor resected with a small cuff of left atrium. The entire tumor and right lower lobe was delivered en bloc, and the left atrial defect subsequently patched. Initial diagnosis of alveolar soft part sarcoma was considered.

**Initial Immunohistochemistry:**

Positive: epithelial membrane antigen (EMA), CD10 and vimentin

Negative: anticytokeratin CAM5.2, thyroid transcription factor-1 (TTF- 1), smooth muscle actin (SMA), S100, HMB-45, MelanA, Hepar and synaptophysin

**Initial CT scan**:

No renal lesion was evident.

**Initial Histology:**

High-grade clear cell sarcomatoid tumor, suspicious for metastatic clear cell renal cell carcinoma, diagnosis specifically considered by the pathologist.

Additional extensive investigation did not reveal a primary lesion or any other metastatic lesions. Then, four months later, patient developed a subcutaneous mass in his left loin.

**Subsequent CT scan** of the abdomen confirmed a large 11 cm tumor occupying nearly the entire right kidney with involvement of the pelvicalyceal system and proximal ureter. The tumor also extended into the right renal vein and the inferior vena cava, with a 2 cm soft tissue nodule was seen in the subcutaneous layer of the left flank. Further imaging of the thorax demonstrated multiple lung nodules, a large right pleural-based mass and an enlarged subcarinal lymph node.

**Bone scan: S**uggested involvement of the right humeral head and multiple thoracic vertebrae.

**Excision biopsy:**  of the subcutaneous nodule was performed, and histology demonstrated a tumor morphologically similar to the initially resected lung lesion, most likely a high-grade clear cell renal cell carcinoma with sarcomatoid differentiation.

**Subsequent Immunohistochemistry:**

Strongly positive: vimentin, CD10; focally positive for epithelial membrane antigen, melan-A

Negative: TTF-1, S100, inhibin and synaptophysin.

Patient was given palliative first-line therapy of sunitinib after his lung surgery. Initially the disease stablizedstable disease, but after three cycles of sunitinib the disease progressed; our patient declined any further therapy and he eventually died 13 months after his initial lung resection.

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| * **What is the primary site?**   **C64.9 Kidney NOS**   * **What is the histology?**   **8310/3 Clear Cell Carcinoma** | | | | * **What is the grade/differentiation?**   **9 unknown** | | |
| **Stage/ Prognostic Factors** | | | | | | |
| Summary Stage | 7 distant | |  | |  | |
| TNM Clin T | cX | | TNM Path T | |  | |
| TNM Clin N | c0 | | TNM Path N | |  | |
| TNM Clin M | p1 | | TNM Path M | | p1 | |
| TNM Clin Stage | IV | | TNM Path Stage | | IV | |
| TNM Clin Descriptor | 0 | | TNM Path Descriptor | | 0 | |
| TNM Clin Staged By | 20 | | TNM Path Staged By | | 20 | |
|  |  | |  | |  | |
| Tumor Size Summary | 000 | | Mets at Dx - Bone | | 0 | |
| Regional Nodes Examined | 00 | | Mets at Dx - Brain | | 0 | |
| Regional Nodes Positive | 98 | | Mets at Dx - Liver | | 0 | |
| CS SSF 1 | 998 | | Mets at Dx - Lung | | 1 | |
| CS SSF 2 | 998 | | Mets at Dx - Other | | 0 | |
| CS SSF 3 | 998 | | Mets at Dx – Distant LN | | 0 | |
| CS SSF 4 | 998 | |  | |  | |
| CS SSF 6 | 998 | |  | |  | |
| CS SSF 8 | 000 | |  | |  | |
| **Treatment** | | | | | | |
| Diagnostic Staging Procedure | | 00 |  | | |  |
| **Surgery Codes** | |  | **Radiation Codes** | | |  |
| Surgical Procedure of Primary Site | | 00 | Radiation Treatment Volume | | | 00 |
| Scope of Regional Lymph Node Surgery | | 0 | Regional Treatment Modality | | | 00 |
| Surgical Procedure/ Other Site | | 4 | Regional Dose | | | 00000 |
| **Systemic Therapy Codes** | |  | Boost Treatment Modality | | | 00 |
| Chemotherapy | | 02 | Boost Dose | | | 00000 |
| Hormone Therapy | | 00 | Number of Treatments to Volume | | | 00 |
| Immunotherapy | | 00 | Reason No Radiation | | | 1 |
| Hematologic Transplant/Endocrine Procedure | | 00 | Radiation/Surgery Sequence | | | 0 |
| Systemic/Surgery Sequence | | 3 |  | | |  |