FIELD OF THE URETER

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The first case of primary carcinoma of the ureter appearing in the literature was reported in 1878. However, no review of the literature on this topic was made until 1909, when Zironi (19) reviewed 5 cases. Richter (13), in the same year, reviewed 11 cases including all of those in Zironi's list. Chevassu and Mock (3) found 12 cases. Chiari (4), in 1914, succeeded in gleaning 17 cases from the literature, a few of which, however, cannot be classed under the list of malignant tumors. Spiess (15), in 1915, made the most thorough review to date, including the benign and malignant growths of both the ureter and the kidney. He lacked access to a few papers but indicated them.

With the reporting of a case of primary carcinoma of the ureter at autopsy, it was decided to review the cases on record of cancer limited to this particular structure and include them in this report, thus adding four more cases to the literature. The cases follow in chronological order.

CASE I. Wising and Blix (18). History and symptoms. Age 41 years, woman. Several months previous to observation, while in a crowd, was pushed against a wall with pressure on abdomen. Since then pain in the right lumbar region. Later patient became aware of a lump in the abdomen.

Examination. When first seen a tumor was palpable in the right abdomen, elongated but smooth. Two months later there was an appreciable increase in size. A few small nodules present anterior to the tumor. Another anterior to the uterus. Patient became

1 In all 157 cases. Of this number but 16 were found to be primary carcinoma of the ureter.
icteric without any accountable reason and died soon after. Clinical diagnosis, tumor of the ureter or rectum.

Autopsy findings. Upper portion of the ureter firm and hard; no mucous membrane left. At various places grayish yellow masses extend upward as far as the kidney. Grayish white strands pierce the muscular coats becoming continuous with the serosa. Many small nodules on the ascending colon. Mesenteric root filled with confluent cancer nodules. Peritoneum spotted with growths. Many subcapsular and interstitial nodules in the liver.

Microscopic examination. Medullary carcinoma of the ureter.

Case II. Davy (5). History and symptoms. Man, age 53 years. Injured in left testicle ten years previously. For two years pain in left loin and side. About five months ago passed a stone, size of a pea, followed by hematuria which has been intermittent since.

Examination. No urinary flow from the left ureter. Operation revealed a cyst on the left kidney, from which 33 ounces of fluid were removed. Wound healed and patient discharged. Returned three weeks later with extreme local pain. Left kidney was then removed. Probe meets obstruction four inches down from upper end of ureter. Wound healed and patient discharged. Death occurred five days later at an infirmary.

Autopsy findings. A growth completely obstructed the left ureter for a distance of five inches upward from the opening into the bladder. At the ureteral opening was a calculus the size of a hazel nut. The liver was studded with white cancerous masses, pea to walnut in size. Lumbar glands enlarged. Base of bladder invaded. Wall of rectum invaded with ulceration into the lumen. Probable cause, ureteral calculus.

Microscopic findings. Medullary carcinoma of the ureter.

Case III. Voelcker (16). History and symptoms. Man, age 68 years. Never sick except an attack of influenza two years ago. Patient noticed discoloration of his urine four months previous to entrance.


Autopsy findings. Some jaundice. Both legs edematous. Colon
adherent to liver. Weight of latter 3118 grams. Left lobe infiltrated by pale soft new growth. Numerous nodules in right lobe. New growth in lower left ureter projecting into lumen as delicate villous processes covered with blood. Outside of ureter, mass the size of a cherry adherent to the pelvic brim. Left kidney showed hydrenephrosis. Metastatic growths in the lymph glands to the left of the aorta. Nodule in right lung.

Microscopic examination. Ureteral growth was a villous carcinoma. Muscular layer invaded. Secondary growths similar in structure to those in the ureter.

Case IV. Hektoen (8). History and symptoms. Woman, age 50 years. Always in fair health. Eight months before death pains developed in the right hip. Lower extremity became swollen. Also swelling present in the right inguinal region. No history of injury.

Examination. Soft mass in right lower quadrant connected with the ileum. Diagnosis, osteosarcoma of the pelvis. Death due to exhaustion.

Autopsy findings. Tumor in the pelvis involving the right ureter. Right sided hydrenephrosis. Probe passed into ureter from the bladder meets obstruction 2.5 cm. from the entrance. Upper portion of ureter entirely lost in tumor tissue. No metastases except paraureteral growth in the pelvis.

Microscopic findings. Typical medullary carcinoma. Many small islets of epithelial cells in the connective tissue.

Case V. Rundle (14). History and symptoms. Man, age 46 years. Year before admission patient noticed a fullness in the right abdomen which increased in size gradually and painlessly.

Examination. Fluctuating mass in lower part of abdomen, extends from a point two inches below the thorax to the middle line as well as far back into the lumbar region. Urine clear. No hematuria recently. No history of calculus. On several occasions the tumor was tapped. Fluid contained many granules and a few epithelial cells.

No clinical diagnosis given. Patient died from exhaustion.

Autopsy findings. Right sided hydrenephrosis. Right ureter markedly dilated at its middle third. Lower third involved in a growth. Ureter nodular to within one inch of the kidney. Largest nodule four inches by two inches. Growth soft, white, and very friable. The left seminal vesical and vas more or less involved. Secondary deposits in the liver, lung and abdominal lymph glands.
Microscopic findings. Squamous celled epithelioma of the right ureter with extensive infiltration of its walls.

Case VI. Minich (11). Woman, age 66 years. (Report of a demonstration at autopsy; details lacking). Carcinoma of the right ureter. Lower third of ureter not patulous and adherent to the bladder and vagina. Perforation into vaginal canal admitting little finger. Perforation must be of recent date, for no changes have taken place in the vaginal wall as a result of urine trickling through the aperture.

Case VII. Gerstein (7). History and symptoms. Man, age 67 years. Periodic hemorrhage for nine months. Six months previous to entry diagnosis of renal hemorrhage was made. No normal urine for two months. Generally a dark red.

Examination. Skin somewhat icteric. Frequent micturition. Pain in the region of the right kidney. Cystoscope revealed a tumor in the region of the right ureteral orifice. It was furrowed; one of the clefts contained a blood coagulum and marked the exit of the ureter. A clinical diagnosis of malignancy was made. Operation showed an ulcerated tumor behind the right ureteral orifice. Removal out of the question. Patient died eight days later from heart failure.

Autopsy findings. Hydronephrosis of the right kidney. A tumor, pigeon egg in size, at the site of the right uretero-vesical junction. Ureter cannot be isolated from the tumor, tissues are too soft. Lower pole of corresponding kidney shows a metastatic nodule. Two nodules in right bladder wall. A pea sized nodule in right middle lobe of lung.

Microscopic findings. Section through tumor in ureter shows a typical carcinoma. Cells arranged in cords and nests. Ureteral lymph-vessels distended by carcinomatous cell masses. Secondaries show similar structure.

Case VIII. Adler (1). History and symptoms. Man, aged 69 years. For eight weeks severe backache, pains radiating toward the bladder. Urine periodically discolored.

Examination. Patient upon standing exhibits a stiff back. Vertebral column from tenth dorsal to the sacral vertebrae shows kyphosis. Urine brown. A clinical diagnosis was given as arteriosclerosis; degenerative myocarditis; chronic vertebral stiffness; tuberculous tumor (?) of the adrenal? (Addison’s disease?). Patient died five months after entry from exhaustion.

Autopsy findings. Tumor of the left ureter 4 cm. from the vesical orifice, extending for 4.5 cm. along the ureter. Lower border well defined, upper border less so. Cut surface is grayish red, except cen-
Tabulated data on all recorded cases of primary ureteral carcinoma

<table>
<thead>
<tr>
<th>CASE NUMBER</th>
<th>REPORTED BY</th>
<th>DATE</th>
<th>SEX</th>
<th>AGE</th>
<th>CLINICAL SYMPTOMS</th>
<th>CLINICAL DIAGNOSIS</th>
<th>OPERATION</th>
<th>CAUSE</th>
<th>TYPE OF TUMOR</th>
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<tbody>
<tr>
<td>1</td>
<td>Wissing-Blix</td>
<td>1878</td>
<td>F</td>
<td>41</td>
<td>Pain, lump in abdomen</td>
<td>Tumor of rectum</td>
<td>-</td>
<td>Calculus suggested</td>
<td>Medullary carcinoma</td>
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<td>2</td>
<td>Davy</td>
<td>1884</td>
<td>M</td>
<td>33</td>
<td>Pain. Passed stone</td>
<td>Tumor found in relation to urinary tract</td>
<td>+</td>
<td>Calculus</td>
<td>Medullary carcinoma</td>
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<tr>
<td>3</td>
<td>Voelcker</td>
<td>1895</td>
<td>M</td>
<td>68</td>
<td>Hematuria 4 months</td>
<td>New growth</td>
<td>-</td>
<td>Calculus</td>
<td>Villous carcinoma</td>
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<td>4</td>
<td>Halstoen</td>
<td>1899</td>
<td>F</td>
<td>50</td>
<td>Pain. Swelling in hip</td>
<td>Osteosarcoma of pelvis</td>
<td>-</td>
<td>-</td>
<td>Medullary carcinoma</td>
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<td>Broudie</td>
<td>1896</td>
<td>M</td>
<td>46</td>
<td>Fullness in right abdomen</td>
<td>None given</td>
<td>-</td>
<td>-</td>
<td>Squamous cell epitheliosis</td>
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<tr>
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<td>Minich</td>
<td>1902</td>
<td>F</td>
<td>66</td>
<td>None given</td>
<td>Details lacking</td>
<td>-</td>
<td>-</td>
<td>Typical carcinoma</td>
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<td>Gerstein</td>
<td>1902</td>
<td>M</td>
<td>67</td>
<td>Frequent hematuria</td>
<td>Malignancy of some sort</td>
<td>+</td>
<td>Calculus may have</td>
<td>Papillary carcinoma</td>
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<tr>
<td>8</td>
<td>Adler</td>
<td>1905</td>
<td>M</td>
<td>69</td>
<td>Pain in back, Hematuria</td>
<td>Chronic vertebral stiffness. Tuberculous tumor of adrenal?</td>
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<td>-</td>
<td></td>
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<td>9</td>
<td>Metcalf-Safford</td>
<td>1905</td>
<td>M</td>
<td>47</td>
<td>Frequent colicky attacks</td>
<td>Ureteral calculus</td>
<td>+</td>
<td>Calculus</td>
<td>Medullary adenocarcinoma</td>
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<tr>
<td>10</td>
<td>Vorpal</td>
<td>1906</td>
<td>F</td>
<td>60</td>
<td>Fell year ago; since then pain</td>
<td>Nephrosis from obstruction due to calculus or neoplasm</td>
<td>+</td>
<td>-</td>
<td>Medullary carcinoma</td>
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<td>Richter</td>
<td>1909</td>
<td>F</td>
<td>80</td>
<td>Pain. Hematuria</td>
<td>Probably neoplasm of urinary tract</td>
<td>-</td>
<td>-</td>
<td>Papillary carcinoma</td>
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<tr>
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<td>Zironi</td>
<td>1909</td>
<td>F</td>
<td>36</td>
<td>Pain. Some hematuria</td>
<td>Hydronephrosis from neoplasms, probably carcinoma</td>
<td>+</td>
<td>Calculus</td>
<td>Medullary carcinoma</td>
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<tr>
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<td>Paschkes</td>
<td>1910</td>
<td>M</td>
<td>65</td>
<td>Pain. Hematuria. Fluctuating tumor in abdomen</td>
<td>Hydronephrosis from malignancy of renal pelvis</td>
<td>-</td>
<td>Calculus</td>
<td>Papillary carcinoma</td>
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<tr>
<td>14</td>
<td>Israel</td>
<td>1910</td>
<td>F</td>
<td>60</td>
<td>Severe pains. Hematuria. Icterus</td>
<td>Tumor of kidney or spleen or both</td>
<td>+</td>
<td>-</td>
<td>Papillary carcinoma</td>
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<td>15</td>
<td>Chevassu-Mock</td>
<td>1912</td>
<td>M</td>
<td>33</td>
<td>No pain. Hematuria for 5 weeks</td>
<td>Ureteral neoplasm</td>
<td>+</td>
<td>-</td>
<td>Epitheliosis</td>
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<tr>
<td>16</td>
<td>Chiari</td>
<td>1914</td>
<td>F</td>
<td>54</td>
<td>Loss of weight. Hematuria</td>
<td>Ureteral obstruction from lodged tissue or neoplasm</td>
<td>+</td>
<td>-</td>
<td>Papillary carcinoma</td>
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<tr>
<td>17</td>
<td>Butler</td>
<td>1914</td>
<td>M</td>
<td>53</td>
<td>Pain. Loss of weight</td>
<td>Sarcoma of ileum with involvement of ureter</td>
<td>+</td>
<td>-</td>
<td>Squamous cell carcinoma</td>
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<tr>
<td>18</td>
<td>Finsterer</td>
<td>1915</td>
<td>M</td>
<td>53</td>
<td>Frequent hematuria</td>
<td>Vesical papilloma</td>
<td>+</td>
<td>-</td>
<td>Papillary carcinoma</td>
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<tr>
<td>19</td>
<td>Spiess</td>
<td>1915</td>
<td>F</td>
<td>41</td>
<td>Pain in back, hips and pelvis</td>
<td>Dementia praeox</td>
<td>-</td>
<td>-</td>
<td>Medullary carcinoma</td>
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<tr>
<td>20</td>
<td>Schmitt</td>
<td>1916</td>
<td>F</td>
<td>55</td>
<td>Pain in iliac region. Anuria</td>
<td>Intestinal obstruction</td>
<td>+ a yr. ago</td>
<td>-</td>
<td>Squamous cell carcinoma</td>
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</table>
tural necrotic portion which is pale yellow. The fourth lumbar vertebra is infiltrated. Body of the bone is soft, and compressible between the fingers. No sign of bone can be seen; quite gelatinous. The site of the tumor is at the linea terminalis, where it is forced to make an angle in its descent. Probably resulted from the lodging of a concretion at an earlier period.

*Microscopic findings.* Papillary carcinoma plus areas resembling squamous carcinoma. Vertebra sectioned without decalcification. Cells correspond to those in the original lesion.

**CASE IX.** Metcalf and Safford (10). *History and symptoms.*

Man, aged 47 years. Patient suffered from childhood with severe colicky attacks. Pain mostly in the left side of the abdomen. Attacks appeared every 2 or 3 years, sometimes remaining for weeks. Marked scoliosis due to sympathetic muscular contraction.

*Examination.* Urine showed pus cells, many reds and a few squamous cells. Skiagraphic examination negative. Cystoscopic examination attempted but there was too much hemorrhage due to an enlarged prostate. A clinical diagnosis of ureteral calculus was made from the frequent attacks of renal colic. An operation was advised. Nephrectomy and ureterectomy performed. Kidney showed pyelonephrosis, while a calculus was found in the lower end of the ureter. Three weeks later patient again developed intense pain, hence second operation for removal of growth extending from the point of ureteral separation to promontory of the sacrum. Death occurred from exhaustion nearly three months after entry.

No autopsy obtained.

Microscopic examination of the tissue removed showed primary adenocarcinoma of the ureter, medullary in character. Tissue removed from behind the bladder showed the same irregular mass of encephaloid cells. There can be no doubt of the etiological relation of the calculus.

**CASE X.** Vorpal (17). *History and symptoms.* Woman, age 60 years. Patient fell on the right side over a year ago. Since then constant pain in back and down the right side. Five months later right sided nephroptosis was diagnosed. A tumor appeared at the same time increasing in size.

*Examination.* Tumor in right abdomen, size of a child's head. Did not move with respiration. The urine showed granular casts, epithelial red and white cells. Cystoscopic examination shows aperture to right ureter occluded by a growth the size of a cherry. There
was much and intense pain. A diagnosis of right sided nephrosis was made, resulting from obstruction of the ureter, due to a calculus, cicatricial stenosis or neoplasm.

Nephrectomy was performed. Ureter was dilated by a neoplasm at its lower end. Patient too weak to complete the operation. Death occurred 8 hours later with signs of embolus.

Autopsy findings. Aperture of the right ureter occluded by a projection the size of a hazel nut. Probe could be passed through its center into the ureter. Growth extended upwards for 5 cm.; 7 cm. farther up was a hard nodule similar to a scirrhus. Metastases were found in the retroperitoneal lymph glands and the liver. A nodule present in both the right kidney and right lung.

Microscopic examination. The tumor near the ureteral orifice appears as a medullary carcinoma, farther up the ureter it takes on the appearance of a carcinoma with cancroid pearls. Metastases similar in structure. In the liver especially both scirrhous and medullary types present.

Case XI. Richter (13). History and symptoms. Woman, age 80 years. Patient well until three months before entry. Then pain in back and right gluteal region. Frequent micturition. Urine blood stained.

Examination. Urine cloudy, reds and whites present. Also epithelial cells possessing the character of tumor cells, all in atypical division. No tumor visible with the cystoscope. The clinical diagnosis was a possible neoplasm of the urinary tract. Death occurred 14 days later.

Autopsy findings. A papillary swelling, hazel nut in size, was found in the right ureter 3 cm. from its vesical end, completely occluding the lumen. Metastases in the lymph gland at upper end of corresponding ureter, greyish red in color and having the consistency of bone marrow.

Microscopic examination. Many branching excrescences in the original lesion. In the deeper portions of the tumor there is an alveolar arrangement of the cells with atypical division. Tumor plugs in the dilated lymph vessels. Secondary in the lymph gland mostly alveolar in structure.

Case XII. Zironi (19). History and symptoms. Woman, age 36 years. Patient had more or less intermittent pains in the right lumbar region for 4 months.

Examination. Tumor in the right abdomen size of a child's head. By rectal and vaginal examination a cord the size of a finger can be
made out in the region of the right ureter pointing to the bladder. The urine contains neoplastic forms and a "pearl of Lebert." A diagnosis of hydronephrosis was made due to a neoplasm (probably carcinoma) in the lower part of the ureter.

Nephrotyomy was performed. Upper end of the ureter was greatly dilated. Digital examination of this end shows a neoplasm the size of a walnut. Patient died nine days after the operation.

Autopsy findings. Right ureter throughout is a mass of neoplasms of varying sizes. Masses have enveloped the lumbar and hypogastric ganglia. Attached to the mucosa at the lower end of the ureter is a calculus whose center is softened containing epithelial elements. Metastases found in the paraureteral lymph glands. Neoplasm probably arose as a result of the chronic inflammation and irritation of the calculus.

Microscopic examination. Primary carcinoma of the ureteral mucous membrane.

CASE XIII. Paschkis (12). History and symptoms. Man, age 65 years. Pains in the left lumbar region for some years. Severe pains with hematuria for 4 months.

Examination. Fluctuating tumor in the left abdomen. Urine bloody. Contains epithelium, cell detritus and leucocytes. Condition of patient did not permit an extensive examination nor operation. Clinically diagnosed as hydronephrosis resulting from malignancy of the renal pelvis. Death occurred 4 days later.

Autopsy. Enormous hematonephrosis of the left kidney. Ureter size of the small intestine at its upper end. At the level of the lower pole of the kidney to which it is attached, the ureter contains a tumor the size of a fist; 2.5 cm. lower down a calcium oxalate calculus the size of a bean, is lodged. Remainder of the ureter is normal. Metastases occur in the lymph glands, in the hilum of the kidney and in the retroperitoneal tissues.

Microscopic findings. Papillary carcinoma resulting from the irritation of the concretion.

CASE XIV. Israel-Loewenstein (9). History and symptoms. Woman, age 60 years. Every 3 to 4 months within the last ten years the patient had excruciating pains arising in the left hypochondrium extending up into the chest and down into the thigh. Swelling, since the beginning of pain, which grew down the left abdomen. Frequent hematuria. Icterus with attacks of pain.

Examination. Skin slightly icteric. Palpable tumor in the left
abdomen size of a child's head. An immovable parenteral mass felt on examination per vagina and per rectum. A diagnosis of a tumor of the kidney or spleen was made. Operation was advised. A hydronephrotic kidney and an enlarged spleen were removed. Blood pressure dropped and the patient died the same day.

_Autopsy findings._ In lower and upper end of the ureter many papillomatous outgrowths into the lumen of the ureter. Between the two a definite tumor infiltrating the paraureteral tissue. Ureter more or less infiltrated throughout. A metastatic nodule present in the left parametrium involving the trunk of the sacral plexus. This one palpable per vagina. Nodule in the right kidney.

_Microscopic findings._ Many of the projections were papillomatous with carcinomatous changes showing cell cords and nests. Lymphatics involved.

_CASE XV._ Chevassu and Mock (3). _History and symptoms._ Man, age 53 years. Hematuria more or less intermittent for 5 weeks; no pain.


There were two nodules in the removed ureter, one having perforated the ureteral wall. Has an embossed appearance and the cut surface is yellow and lardaceous in appearance. A white granulation under capsule of the kidney. No metastases evident.

_Microscopic findings._ Primary epithelioma of the ureter. Plain muscle was infiltrated. Small nodules were situated in relation with large vessels. Others gave appearance of having developed in the lymph vessels. Paraureteral tissues free. Nodule in kidney was an adenoma.

_CASE XVI._ Chiari (4). _History and symptoms._ Woman, age 54 years. Hematuria three months before entrance; again two weeks before entrance. Decrease in weight.

_Examination._ No tumor mass; no tenderness. Urine contains a few reds and a few whites. Cystoscope shows absence of urinary flow from the left ureter; only a few drops of blood exude. Probe in left ureter meets obstruction 8 cm. from the bladder. The clinical diagnosis of obstruction of the left ureter was made, due to lodgment
of tissue from the kidney or a neoplasm at the site of obstruction. Operation advised. Nephrectomy and ureterectomy performed. A tumor the size of a “nut” was found in the ureter 10–12 cm. from its lower end. The ureteral wall was bound to the paraureteral tissues.

Patient recovered and was well one year after the operation.

The ureter shows a papillary tumor the size of a cherry whose base nearly encircles the wall of the ureter. From its warty surface a projection 2 cm. in length hangs into the lumen of the ureter. Wall more or less infiltrated.

*Microscopic examination.* Papillary carcinoma. The carcinomatous cell nests have infiltrated the musculature of the ureteral wall. Growth has not spread beyond the ureter.

**Case XVII. Butler (2).** *History and symptoms.* Man, age 53 years. Hematuria nineteen and again seven months previous to entrance. Later incontinence. Much pain. Loss in weight.

*Examination.* Complains of sciatica. By palpation a firm mass 3 inches in diameter is felt to the right of the umbilicus. Tenderness in the right sacroiliac region. Catheter in the right ureter meets obstruction 6 cm. from the orifice. No urine from right catheter. Right testicle enlarged. The clinical diagnosis was sarcoma of the right ileum with secondary involvement of the ureter. An operation advised. A tumor was found behind and below the kidney spreading over the surface of the ileum and sacrum. Had the appearance of a sarcoma. A small portion was excised for microscopic examination. The testis was considered a metastatic growth and removed but contained only normal tissue. Patient gradually declined and died two weeks later.

*Autopsy findings.* Large tumor mass obliterating the central half of the right ureter. Another lesion at the lower end of ureter. There was infiltration of psoas and iliac muscles, perirenal tissues, retroperitoneal tissues and the lumbar plexus.

*Microscopic findings.* The diagnosis was changed to primary carcinoma of the ureter after examination of the excised tissue. The mass was made up of solid areas of squamous cells. Small amount of connective tissue. Some epithelial whorls.

**Case XVIII. Finsterer (6).** *History and symptoms.* Man, age 53 years. Bloody urine 4 years ago. Oft repeated.

*Examination.* Hemorrhage from urethra. Diagnosis was that of vesical papilloma.

Operation showed a papilloma of the left trigone the size of a pigeon
egg and extending up the left ureter. Ten cm. of the ureter was removed and the stump sutured to the bladder. Recovery.

Microscopic findings. Beginning carcinomatous degeneration of ureteral papilloma.

Case XIX. Spiess (15). History and symptoms. Woman, age 41 years. Pleurisy twice. Angitis in left leg. For three weeks pain in back, hips, pelvis, radiating into the right thigh.


Autopsy findings. Tumor in the right ureter 3 cm. from the bladder and 1.5 cm. in thickness; remainder of ureter more or less infiltrated. Paraureteral tissue raised in nodules protruding forward into the peritoneal cavity but covered by peritoneum. Many yellowish white masses extending from iliac fossa to the kidney. Both psoas muscles invaded. Aorta and inferior vena cava surrounded by growths. Subpleural lymph-vessels of upper and right lower lobes filled with tumor masses. Lung substance of both upper lobes involved. Glands at hilus enlarged. Metastases also in the right fallopian tube, mesenteric, retroperitoneal and left axillary nodes, and in the cysterna chyli.

Microscopic findings. Ureteral carcinoma. All metastases similar.

To the above cases already recorded is added the following new case.

XX. History and symptoms. Woman, age 55 years. The patient was admitted to Cook County Hospital on August 24, 1915, brought in an ambulance.

The following history was elicited: Complains of diffuse pains in the abdomen. Is constipated, has had no movement for three days; no nausea, vomiting or headache. Five weeks ago the patient was seized with severe pains in the left abdomen low down in the iliac region; three days later she began vomiting and has vomited considerably ever since; was in bed constantly for the last four weeks; for the past two weeks has had diffuse pains in the abdomen; abdomen tender; constipated for nine months; has used cathartics for three months; headache after vomiting spells; pain and soreness in the back in region of
the left iliac bone for five weeks. Operated on at another hospital last December for tumor, abscess and "decayed ovary." Married 18 years; husband is alive. No venereal disease. Rheumatism since she was forty-five. One miscarriage; curetted at 35 for dysmenorrhea; has not menstruated for 6 years.

Examination revealed marked anemia; many teeth missing, tongue coated, larynx negative. Urine negative as regards albumin and casts; later examination shows hyaline and granular casts. Blood count shows 23,800 white corpuscles. Operation showed many adhesions about the intestines.

Clinical diagnosis of intestinal obstruction was made. Tuberculous peritonitis was suspected. Patient died November 5, 1915, from exhaustion. Autopsy was performed by Dr. H. Gideon Wells.

Autopsy. External appearance. The body is that of a tall, poorly nourished woman; the skin is white, no icterus, pallor about the nipples. Healed abdominal incision in the midline from the umbilicus to the pubis. Superficial lymph glands are not palpable. No subcutaneous edema. There is a superficial excoriating of the skin about the buttock on each side of the anus. Subcutaneous fat dark in color.

Abdominal cavity. Omentum diffusely adherent to anterior abdominal wall, many diffuse adhesions on the right side binding the intestines together; many blackish spots on the parietal peritoneum; several loops of the intestine are bound together in a solid mass; dense adhesions bind the stomach to the liver; the latter is also adherent to the diaphragm; firm fibrous adhesions about the gall bladder, inguinal and femoral rings closed; no acute inflammation; adhesions are dense in the pelvis and on the right costal margin; to the left of the median line there is a large retroperitoneal mass to which the upper part of the jejunum is firmly adherent and sharply kinked; the colon is not involved; the mass is apparently related to the kidney. The spleen is embedded in adhesions; it is not related to the tumor mass. There is a fresh blood clot in the pelvis in the region of the sigmoid, also many adhesions here; the bladder is moderately distended; the uterus firmly adherent to the parietal peritoneum
at the center of the left pelvis; left ovary and tube have been removed; no evidence of obstruction of the bowels; no gangrene.

Pleural cavity. There was no excess fluid; no adhesions except at right lower lobe which is adherent to the diaphragm.

Pericardial cavity is normal.

Heart. Weight, 240 grams. Coronary arteries not unduly prominent and normal in size. Beginning of aorta shows slight sclerosis and slight dilatation; thoracic aorta shows no abnormalities. All valves normal. Cardiac walls slightly atrophied.

Lungs. Small and inelastic. Right, weight 280 grams. At hilum there is a small calcified bronchial gland; organ very light; no areas of consolidation; near the base is a small white calcified nodule, 2 mm. in diameter. Left, weight 200 grams, presents the same general appearance.

Liver. Weight, 1140 grams. Small, a few calcified nodules in the adhesions; a white nodule in the left lobe, 7 mm. in diameter, which extends 3 mm. into the liver tissue; also one in the right lobe 2 mm. in diameter; the cut surface shows another of the same appearance. The gall-bladder is distended and under tension; contains 16 small concretions, dark in color, average 2–3 mm. in diameter; they are quite firm, have a light colored center; common and hepatic ducts normal.

Spleen. Weight, 100 grams. Approximately normal in size and consistency.

Stomach and intestines are normal.

Pancreas. For a distance of about 3 cm. down from the head are small areas where the fibrous tissue is slightly increased; there are also a number of whitish necrotic spots extending into the pancreas.

Adrenals. Both are normal except for post mortem changes.

Kidneys. Right, a little firmer than normal, capsule somewhat adherent; when latter is removed leaves a slightly granular surface; the pelvis and ureter are not distended. Left, perirenal tissue more fibrotic than normal. Pus is found under pressure in the distended pelvis and the kidney is slightly atrophied, cortex and medulla together measuring 10–15 mm. The kidney itself is not involved by necrotic tissue except in the
floor of the pelvis; one white nodule 5 mm. in diameter in the cortex; consistency diffusely increased and capsule firmly adherent.

Bladder. The mucous membrane is granular around the urethral opening; otherwise normal.

Generative organs. The right ovary, the only one remaining, is normal. The uterus is adherent to the pelvic wall on the left side, rather small, and there is an increase of whitish tissue in the submucosa; an encapsulated firm nodule, 1 cm. in diameter, is embedded in the anterior wall just above the cervix; the cervix is distended to 8 mm. diameter by a plug of viscid mucus at the external os. Vagina normal.

Tumor mass. A tumor mass in the left abdominal cavity and in relation to the left kidney is very firmly adherent to the abdominal wall and to the anterior wall of the vertebral column from the eleventh dorsal to the third lumbar vertebra. This mass is fluctuating and when ruptured there issues a purulent cloudy fluid, containing shreds of necrotic tissue. The dorsal boundary is quite necrotic, the growth having invaded the bodies of the vertebrae, that of the third being almost destroyed. The growth also infiltrates but does not follow the psoas muscles. When opened it is found to consist of a cavity about 10 cm. in diameter and 15 cm. vertically, with walls of a friable pinkish shredded tissue on a firm white base, totalling 2–3 cm. thick in most places. Laterally this wall is well defined but medially it involves the vertebral column by infiltration to such an extent that it cannot be separated from the bone. The upper boundary is somewhat above the junction of the ureter with the pelvis of the kidney. The origin of the ureter (fig. 1 ur₁) is occluded by cancer tissue, causing a dilatation of the renal pelvis. The lower boundary is continuous with ureter, which is found extending as an occluded, attenuated and infiltrated solid cord about 3 cm. within the cavity (ur₂). The ureter below this point, where it makes its exit from the cavity, is normal (ur₂). Regional lymph glands do not seem to be involved, but there is some diffuse neoplastic tissue about the aorta and cava, binding these vessels and the prevertebral tissue into a solid mass with the ureteral growth.
Histological findings. The microscopic findings confirm the anatomical diagnosis—transitional celled carcinoma with primary origin in the ureter; the latter was obliterated and the retroperitoneal tissues quite extensively invaded. Metastases were found in the portal canal of the liver, under the capsule of the left kidney, and in the bodies of several vertebrae; the latter showed an invasion of the bone trabeculae by the tumor.
cells, also a decrease in the hemopoetic function of the narrow and quite extensive necrosis; no hornification or tubule formation of the epithelium.

The lungs showed senile emphysema; the liver, fatty changes; in the spleen slight pigmentation and fibrosis. Fatty infiltration was noted in the pancreas and early fat necrosis with beginning deposition of calcium. The right kidney showed hyaline casts, some interstitial and hemorrhagic nephritis and a few hyaline glomeruli. The left kidney, besides the neoplasm, showed parenchymatous atrophy, fibrosis and many leucocytes. The ovary, besides showing the corpora albicantes, presented typical senile changes and the absence of Graafian follicles. The submucosa of the uterus was quite hyperplastic and in its wall was found an interstitial uterine fibromyoma which possessed a good deal of hyaline connective tissue.

Of the 20 cases here tabulated the sexes are equally represented numerically. The average age is 55.8 years, that for the female being slightly lower, 54.3 years. The youngest patient was a woman of 36; the oldest, a woman of 80. Most of them are accidental findings at autopsy, a few are diagnosed clinically.

The symptomatology gives rise to a few interesting points: The onset of the trouble was invariably insidious and painless, the first evidence being usually a swelling in the abdomen noticed by the patient, which is generally attributable to a hydronephrosis due to ureteral obstruction. Hematuria takes place almost without an exception and may be intermittent or continuous and extend over a period of years. Pain is often severe and intense, but appears late in the course of the disease.

No very satisfactory conclusions as regards the etiology of these tumors can be drawn from the table. In four cases calculi were found; in two other cases calculi were suspected to have been present at some time antedating the trouble. When present, they occur, as pointed out by Spiess, at one of three anatomical regions of the ureter, viz., at its origin, at the angle where it crosses the linea innominata and at the narrowed portion before entering the bladder.

Operations were performed on 10 patients with 3 recoveries.
These were done either for exploratory purposes, thus helping to establish a diagnosis by removal and examination of the pathological tissues, or for removal to relieve pain. Death in a few cases was immediately postoperative, in the remainder it was due to exhaustion.

All these cases, except the three recoveries where the lesion did not extend beyond the ureteral musculature, showed quite extensive infiltration and often necrosis of the surrounding tissues. Metastases occurred in nearly all the cases, the lung and liver frequently being the seat of these secondary growths. One case showed tumor thrombi in the neighboring blood-vessels, while most of them showed metastases in regional lymph glands, and tumor nodules and thrombi in the lymph vessels draining the part. Of the cases reported as recoveries it was too early to state at the time reported whether there was a recurrence, although one patient, that of Chiari, was well one year after the operation.

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