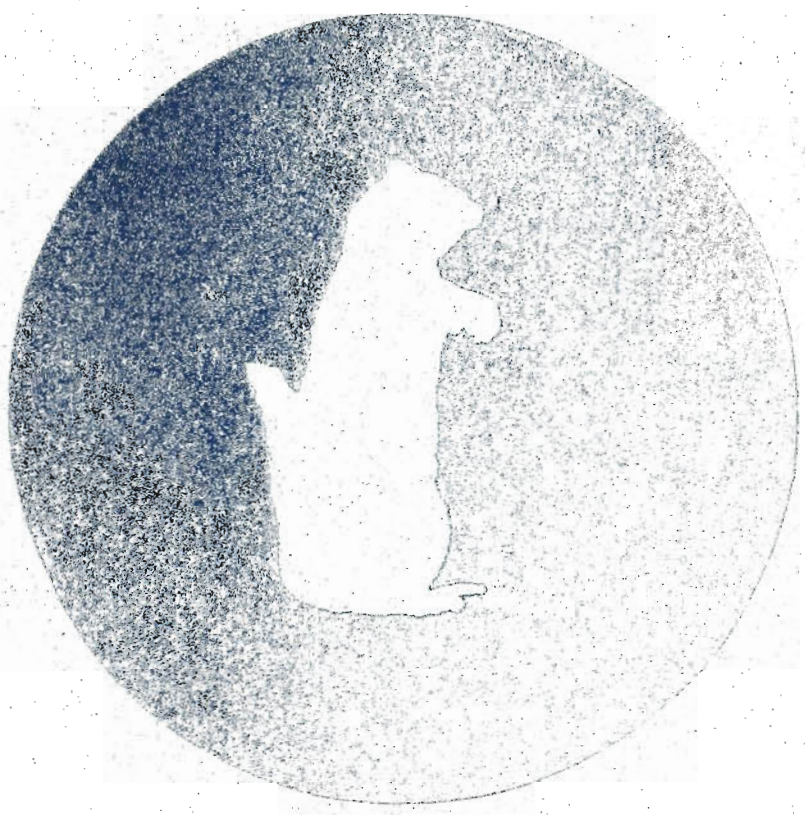

Kidney Tumors

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C O U R T E S Y O F C I T I Z E N S A I D S O C I E T Y

I. ABSTRACT

KIDNEY TUMORS

By Alex Blumstein.

Geschickter and Widenhorn present study of 200 cases of nephrogenic tumors observed in the Johns Hopkins Hospital.

"Most renal tumors may be related to stages of development in the permanent kidney."

"Tumors of the kidney may be separated into two major groups--medullary and cortical, based upon the fact that the permanent kidney has a two-fold origin. The ureter, pelvis, calices, and collecting tubules arise as a system of ducts from the more primitive wolffian duct, and may be termed the excretory or medullary portion of the kidney. The glomeruli and system of convoluted tubules that secrete the urine are derived from a cap of undifferentiated mesodermal tissue (the so-called nephrotome) which surrounds the blind ends of the branches growing from the wolffian ducts, and may be termed the secretory or cortical portion of the kidney."

Tumors of excretory portion of the kidney include papillomas of the renal pelvis and similar neoplasms arising in the ureter. They constitute less than 5% of all renal new growths. The nephrogenic tumors arising in the cortex constitute the majority of tumors arising in the kidneys. (Geschickter and Widenhorn)

Embryonal Nephroma or Wilm's Tumor

Incidence

"These tumors are among the most frequently observed malignant growths in infants, being exceeded only by the group of neurogenic tumors involving the brain, eye, and adrenal commonly referred to as medulloblastoma, retinoblastoma, and neuroblastoma."

"Hinman and Kutzman report a 0.06% incidence of kidney tumors in children and 0.25% in adults. However, the relative incidence of kidney tumors to tumors in general is: in children, 20.4%, in adults 0.5%."

Age

The average age of patients with Wilm's tumor is slightly under 3 years; cases occurring after the age of 7 are rare. In Geschickter and Widenhorn's series, there was only one adult showing this type of lesions.

Sex

In 111 collected cases, there was no appreciable difference in sex.

Symptoms

"The usual story is that an abdominal mass is discovered by the parents or during a general physical examination for some apparently minor complaint."

In 111 cases reviewed by Prather and Crabtree, the initial symptom was:

(1) Mass, 80.1%
(2) Hematuria, 14.5%
(3) Pain, 5.4%

As the tumor increases in size, ascites and edema of the lower extremities may become evident.

Diagnosis

It is necessary to rule out neuroblastoma, lymphosarcoma of the retroperitoneal nodes and "carcinoma of the sex glands in the female or in aberrant gonadal tissue in the male." Mesenteric cysts must also be considered.

In neuroblastoma of the adrenal of the Hutchinson type, retrobulbar metastases with exophthalmos or involvement of the bones is helpful in establishing a diagnosis. Geschickter and Widenhorn state "in our experience, it is extremely rare for Wilm's tumors to metastasize to the bones, although this occurs in about one-third of the cases of neuroblastoma.

Lymphosarcoma is extremely rare in infants.

Tumors of the sex-cell type are prone

to produce changes in secondary sex characteristics.

There are three important diagnostic tests in making a differential diagnosis of retroperitoneal tumors in children. (1) Pyelography, (2) Aschheim-Zondek test, and (3) a course of deep x-ray therapy. The shift in position of the renal pelvis is especially significant in the diagnosis of these tumors. Deep x-ray causes the most rapid shrinkage in lymphosarcoma, less rapid in Wilm's tumor and least rapid in neuroblastoma of the adrenal.

Pathology

"These tumors usually grow to an immense size. They occur beneath the capsule of the kidney, extending toward the pelvis and compressing the normal parenchyma."

"The organs most commonly the site of metastases are the liver and lungs."

Histologically, these tumors are often very complex, besides cells, destined to elaborate nephrogenic tissue, they may contain islands of smooth and striated muscles, cartilage or bone.

Prognosis and Treatment

"All authors are agreed upon the grave prognosis in this group of neoplasms. In the cases reviewed by Prather and Crabtree, 70% of the patients died within fifteen months. Only 12.3% survived treatment beyond two years."

"While Wilm's tumor is definitely radiosensitive, and should receive preoperative irradiation, the permanence of the results achieved by this type of therapy have not yet been established."

Malignant Nephroma or So-Called Hypernephroma

This is the most common tumor of the kidney in adults, and arises near the renal capsule in the cortical area of the kidney. They are characterized, clinically, by their appearance in adults beyond the age of 50 by early metastasis to the bone and by pain and enlargement in the region of the flanks, with accompanying hematuria.

Clinical Features

The outstanding symptoms are:

(1) Pain in the flank.
(2) Pain in the flank radiating into the groin.
(3) Loss of weight and strength.
(4) Hematuria.
(5) Chills and fever.
(6) Symptoms referable to bone involvement.
(7) Nausea.
(8) Renal colic.

Varicocele due to venous obstruction may appear in the scrotum on the affected side.

Creevy states:

(1) "Pyrexia is not an infrequent accompaniment of malignant nephroma (the so-called hypernephroma)."

Geschickter and Widenhorn state:

"The bones are secondarily involved in one-third of all nephromas, the order of frequency being humerus, spine, femur, pelvis and ribs."

The most important diagnostic findings are obtained by urological examination.

Pathology

Four microscopic types have been described:1. papillary, 2. diffuse, 3. granular cell, and 4. clear cell.

Geschickter and Widenhorn state "no sharp dividing line exists between those four tumor types, nearly all cases showing a combination of two, three, or all four microscopic pictures."

Most of the lesions in the Johns Hopkins series were not located near the adrenals and in recent years "all of the reports in the literature have discredited the theory of Grawitz that these tumors are of suprarenal origin."

Prognosis and Treatment of Malignant Nephromas

(Geschickter & Widenhorn)

"The prognosis and curability of malignant nephroma depend upon the promptness with which nephrectomy can be instituted, and upon proper irradiation. Although hematuria cannot be called an early sign, it is often the only definite finding in these otherwise silent tumors." "Regardless of the type of treatment, the prognosis of malignant nephromas is extremely grave."

In the authors' series, only 4 patients survived beyond the five-year period.

Adenomas

For purposes of discussion, Kretschmer and Doehring divide these tumors into three groups:

(1) tubular
(2) alveolar
(3) papillary

According to Geschickter and Widenhorn, these lesions may undergo malignant changes. They must be distinguished from tumors arising in the renal pelvis.

Incidence

Dunn, in the course of 80 consecutive postmortem examinations in which the kidneys were carefully studied for aberrant epithelial structures, found adenopapillary tissues or papilliferous cysts in 9 cases or over 10% of the specimens studied. Bell states that benign adenomas are frequently found in arteriosclerotic kidneys.

Clinical Features of Benign Adenomas

"Adenoma of the kidney as a clinical entity is rather rare." (Creevy) Among nearly 60 cases of benign renal adenomas in the Johns Hopkins series, only 5 gave indications of their presence during the lifetime of the patient. Four of the cases occurred in children.

Creevy reports an interesting case of a tumor of the left kidney in a 24 year old female. The lesion, 3 cm. in diameter, was located deep in the cortex and led to early ulceration into the pelvis with bleeding. "The gross appearance and situation of the tumor were those of an adenoma, while its histologic appearance was that of a typical carcinoma of the cortex . . . ."

Pathology

"The majority of adenomas of the kidney are small and situated just beneath the renal capsule. The growths vary in diameter from a millimeter to a centimeter, but occasionally measure 5 to 10 cm." In the larger lesions, it is hard to rule out malignant changes.

The lesions may be solid or intracystic growths. Microscopically, they are composed of small epithelial cells with dense nuclei arranged to form irregular channels or small circular tubes when seen in cross section." "In the papillomatous type, the epithelial elements are larger and are separated by dense fibrous stalks.

Prognosis and Treatment

(Geschickter and Widenhorn, p.635)

"Interest in prognosis and treatment of these lesions is limited to the larger growths which may produce symptoms and which may undergo malignant change. In all the larger adenomas giving sufficient symptoms to warrant exploration, malignancy is to be suspected. Regardless of microscopic appearances, such growths are best treated by nephrectomy. In performing this operation both the pelvis and ureter should be carefully explored, since extension and transplantation in this direction may occur."

For the definitely benign lesions, Kretschmer and Doehring advise resection of the kidney.

Malignant Cystadenoma

There were 20 such tumors in the Johns Hopkins series. Geschickter and Widenhorn feel that the lesions are distinct from malignant nephroma

in both gross and microscopic appearance and, "in nearly every instance a relationship to benign papillary cystadenoma could be traced under the microscope. In many of these cases, one or more benign cystic papillomas co-existed with the malignant growth."

Clinical Features

Age

Eight of 20 patients reported by the authors were under 40. Pain, hematuria and a mass in the flank were the common findings. Fever and metastases to the bones were also observed. Distortion of the renal pelvis or calyces is usually present. Braasch has called attention to calcified streaks visible on the x-ray plate.

Pathology

"Although the growth of these tumors is usually slow and protracted, and many of them are encapsulated, local invasiveness does occur, and extension or transplantation to the renal pelvis is not uncommon by the time the patient comes under clinical observation." The growth may occur in the upper, middle or lower part of the kidney. The bulk of the smaller tumors, 3 to 5 cm. in diameter, is in the cortex immediately beneath the capsule of the kidney. The larger growths invade the renal pelvis.

"The malignant cystadenomas have amicroscopic structure resembling in general pattern the benign tubular adenomas. The cells have a scanty cytoplasm, a prominent nucleus, and are oval or elongated in shape. The tumor has an intertwining tubular arrangement or grows in strands terminating in small rounded tufts. Numerous small tubules are seen in cross-section. In the more malignant growths the epithelial cells with a small but definite amount of cytoplasm rest upon a stroma which contains many small spindle cells recalling the sarcomatous features of the Wilms tumor."

"The microscopic distinction between some of these malignant cystadenomas and the benign growths from which they arise may be extremely difficult. There are no outstanding microscopic features by which the two can be distinguished invariably. It is a far safer rule to regard all cystadenomas over 4 cm. in diameter as malignant."

Prognosis and Treatment
(Geschickter and Widenhorn)

"While the growth of these neoplasms is slow, extension and metastasis are the rule. Judging from the present series of cases, the prognosis is just as grave as in the so-called hypernephromas. Thrombi of malignant cells may be found in the veins, metastases to the lungs and abdominal viscera occur, and the bones may be involved by secondary deposits. All of the 20 patients in the present series have been followed. Two are alive two and three years following nephrectomy, and one is living over one year. The remainder are dead."

ABSTRACT

Tumours of the Renal Pelvis and Ureter

J. Swift-Joly, The British Journal of Urology V, #4: 327 (December 1933).

"Epithelial tumours of the renal pelvis are distinctly rare when compared with neoplasms of the kidney itself. Statistics on this point vary enormously but the average of those available is between 7 and 8 per cent." They may be divided into two main groups: (1) papillary, (2) solid. The papillary tumors comprise (1) benign papillomata and (2) papillary carcinomata. The solid growths consist of (1) transitional-cell carcinomata if they arise from cells similar to those found in normal transitional epithelium, and (2) squamous-cell carcinomata, which are formed of cells that have no counterpart in normal transitional epithelium.

The classification is not strictly accurate as in many cases the growth has the appearance of two or more of the sub-groups.

The papillary growths comprise three-quarters of the whole. Out of 337 cases, 120 were benign, and 138 car-

cinomatous. Twenty-nine were transitional-cell carcinomata and 50 squamous-cell. "More than half the cases of papillomata occurred in patients between the ages of 30 and 60, while most of the malignant growths were found between the ages of 40 and 70. They are more common in the male than in the female."

"In the case of papillary growths, no predisposing causes have been found. They appear to originate in the pelvis of normal kidneys. In the case of solid growths, stone and infection are important aetiological factors. This is most marked in squamous-cell growths, where more than half the tumours arise in cases of calculous pyonephrosis."

"The solid tumours are usually single; but in almost half the cases multiple papillary growths were found. The latter tumours have a great tendency to form secondary implantation growths in the ureter and bladder." "The solid tumours have a greater tendency to invade and replace the kidney tissue than the villous."

Symptoms

"Haematuria is the most common, and most important, symptom in cases of papillary growths. When the growth is solid, pain is the predominant symptom. Pyelography is the only method by which the diagnosis of a neoplasm of the renal pelvis can be definitely established. The symptoms resemble those of a renal neoplasm so closely that it is impossible to distinguish them without the aid of a pyelogram."

Treatment and Prognosis

"The treatment of villous tumours consists in removal of the kidney and ureter. Simple nephrectomy is so often followed by recurrences in the ureter that it ought to be abandoned. When the tumour is solid, nephrectomy with removal of the lumbar portion of the ureter is usually sufficient."

"The prognosis is very grave. A recurrence was found in approximately half the cases of benign papilloma which were followed up, and in about two-thirds of the cases of papillary carcinoma. A "cure" has only rarely been obtained when the growth was solid."

Tumors of the Ureter

"Tumors of the ureter are much less common than those of the renal pelvis. They are, however, similar in structure, and the same classification has been adopted. In 101 out of 133 cases the growth was papillary. In approximately half the cases, the neoplasm was found in the lower third of the ureter.

"The symptoms are similar to those of neoplasms of the renal pelvis, and the differential diagnosis can only be made by pyelography. When the tumour is visible on cystoscopy, pyelography should be employed to exclude a growth of the renal pelvis.

"A complete nephro-ureterectomy is the operation usually indicated. If the growth is confined to the lower extremity of the ureter, it may be resected, and the ureteric stump reimplanted into the bladder.

"The prognosis is grave, but better results have been obtained when the tumour was villous than when it was solid."

Squamous Cell Carcinoma of the Kidney

Wells describes an interesting case of "primary squamous cell carcinoma of the kidney, arising as a sequel of renal calculi." He states, "In all, I have found eleven cases of squamous-cell carcinoma of the renal pelvis sufficiently thoroughly reported to be unquestionable. In these, the presence of calculi is mentioned in six."

He believes that the metaplasia of the transitional epithelium to the squamous type, with formation of keratin was "apparently the result of chronic irritation from renal concretions."

Impressions

1. Tumours of the kidney may be

separated into 2 major groups--medullary and cortical.

2. Tumours of the excretory portion of the kidney constitute between 5 and 8% of all renal new growths.

3. Embryonal nephroma or Wilms tumor is among the most frequently observed malignant growths in infants, being exceeded only by the group of neurogenic tumors.

4. The average age of patients with Wilms tumor is slightly under 3 years.

5. These tumors usually grow to an immense size and they are often very complex histologically.

6. The prognosis in Wilms tumor is very grave.

7. Malignant nephroma is the most common tumor of the kidney in adults. It is characterized, clinically, by early metastases to the bone, and by pain and enlargement in the region of the flanks, with accompanying hematuria.

8. Most of the reports in the literature have discredited the theory of Grawitz that these tumors are of suprarenal origin.

9. "Regardless of the type of treatment, the prognosis of malignant nephromas is extremely grave." In a fairly large series, only 4 patients survived beyond the five-year period.

10. Adenoma of the kidney as a clinical entity is rare.

11. Some authors are of the opinion that these lesions may undergo malignant change. In the larger lesions, it is difficult to rule out malignancy.

12. Malignant cystadenoma was found in 20 of 200 cases of kidney tumor. There may be metastases to the bone and judging from the small series the prognosis is just as grave as in the malignant nephromas.

13. Tumors of the renal pelvis may develop as papillary and solid growths. The papillary growths may be benign or malignant; the solid growths may be transitional cell or squamous cell carcinoma.

14. Wells describes a true instance of metaplasia of transitional epithelium to the squamous type with formation of keratin.

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II. CASE REPORT

PAPILLARY CARCINOMA OF RIGHT KIDNEY PELVIS.

Fifty-five year old, white male, on admission complains of pain in the right side and hematuria since February 1933.

Colic

2- -33 - Passes blood in urine. This is followed in several hours by severe pain in right costovertebral area, radiating into right thigh, both inguinal areas and across epigastrium to left side. Pain lasts about 20 minutes following which he is free for about one-half hour when he again has an attack of similar pain which lasts for three-quarters of an hour. From this time until January 6, 1934, he loses 10 lbs. in weight.

Physical Examination

7-9-34 - Essentially negative. Hemoglobin 100%. Urine contains red and white blood cells. Cystoscopic examination shows slight degree of cicatricial urethritis. A catheter is passed up to the right kidney and blood is recovered, that from left is clear urine. Plain x-ray of urinary tract - negative.

X-ray

Excretion urogram with neoskiodan reveals left kidney is normal but right is uniformly dilated as are the calices and pelvis. There are filling defects above and below the lower major calyx which are very suggestive of renal neoplasm; however, the ureter on right side fails entirely to fill, which raises the suspicion of soft stone at the ureteropelvic juncture, which does not cast a shadow.

Rather than to do an exploratory operation, it is felt that the patient's best interests are to be served by a delay of six weeks and he is given a date to return for check-up examination.

Exploration

10-11-34 - Readmitted for exploration of right kidney. In meantime, pyelographic study reveals a deformity characteristic of renal neoplasm.

10-12-34 - Papillary carcinoma of right renal pelvis confined to pelvis and parenchyma is found. There is no clinical evidence of metastasis, x-rays of the chest being negative, nor is there any evidence of involvement of the ureter. The right kidney and upper half of ureter is removed.

10-25-34 - Discharged with advice to return in 6 weeks for a right ureterectasis.

12-6-34 - Readmitted. Free of symptoms and wound in right flank is well healed.

Operation

12-7-34 - Right ureterectomy. Half dozen metastatic implants of tumor of pelvis are found in lower ureter which is somewhat dilated and presents a thickened wall. The intramural ureter is electrocoagulated at time of ureterectomy, and about 10 days after operation cystoscopic study is carried out to make certain that there are no implants in bladder (none are found).

12-21-34 - Discharged in satisfactory condition. To be given high voltage treatments and to be checked for possibility of metastasis to bladder at regular intervals.

III. CASE REPORT

SQUAMOUS CELL CARCINOMA OF KIDNEY, SOLID TYPE.

Fifty-nine year old, white male whose complaint on admission is steady pain in left testicular region.

Pain and Blood

1934 - Notes pain left testicle and discharge of blood-tinged urine.

11- -34 - Passes blood and one of the clots obstructs the urethra.

Weight Loss

12- -34 - Pain more severe and radiates to back and left side. There is swelling of testis. Loses about 40 lbs. in weight since onset of illness.

1-28-35 - Urologic examination -

functionless left kidney, probably neoplasm; congenital reduplication, right kidney pelvis; moderate hydronephrosis, right.

Operation

2-13-35 - Exploratory operation. Left kidney fixed to perirenal tissue. Nephrectomy carried out. Examination of kidney: There is firm lesion which occupies the midportion of the kidney and most of the pelvis. The lesion is white and appears to be fibrous. Microscopic section: shows epithelial cells arranged in nests and cords penetrating the stroma. The cells are intensely basophilic, the nuclei are round and somewhat hyperchromatic. Mitotic figures are infrequent.

Diagnosis: Squamous cell carcinoma without keratinization.

IV. CASE REPORT

CARCINOMA (HYPERNEPHROMA) OF RIGHT KIDNEY. RIGHT NEPHROLITHIASIS.

Fifty-three year old, white male with an involved history difficult to interpret.

Colic

1928 - Patient is digging potatoes. In evening he developes severe pain in posterior portion of right hip. The pain radiates to lower abdomen and end of penis. Physician diagnoses kidney stones.

3- -29 - Similar attack. Getting weaker. Between this time and admission (3-17-31) he spends most of his time in bed. He is unable to sit up for any length of time because of severe pain in back. He states that he has passed considerable blood in urine on 2 occasions. He also says that he passed small stones.

Gas

3-17-31 - Admitted. Complains of extreme dizziness as well as recurrent attacks of severe pain in the right side. General physical examination - slight tenderness over lumbar spine. Blood - negative. Urea nitrogen - normal. Urine - numerous leucocytes and few erythrocytes. P.S.P. excretion - 65% in two hours. Blood pressure is 150/95. Patient is free of fever. Plain x-rays made of urinary tract on 2 occasions, but are unsatisfactory because of presence of large amount of gas in bowel.

Cystoscopic Study

Cystoscopic study is carried out, and shows a moderate degree of diffuse cystitis. The indigo carmine excretion of each kidney is normal. The urine from the two sides is apparently normal. A pyelogram of right is made, and as far as could be ascertained in the presence of such large amounts of gas, this is normal. X-rays of chest show an ancient diaphragmatic pleurisy, probably not of present significance.

Psychoneurosis

Patient is seen by a neurologic consultant, who suggests that the headaches might be due to refractive error. He finds no definite evidence of nerve lesion. The orthopedic consultant feels that the pain is not related to the osseous system.

Diagnosis of marked psychoneurosis with very slight degree of pyelonephritis and cystitis is made. The question of nephrolithiasis can not be settled because of the large amount of gas in patient's abdomen.

3-24-31 - Dismissed without treatment and advised to return in 6 weeks for reinvestigation.

11-12-31 - Readmitted. In interim, he passes stones about every 3 weeks. These are small and do not give him much pain.

3- to 11- 9-31 - No pain, hematuria or dysuria.

Hematuria

11-9-31 - Marked dysuria with hematuria.

11-17-31 - Pyelogram shows congenital deformity of left kidney pelvis; probable tumor, right kidney pelvis. Cystoscopic examination reveals a small stone in the bladder. The urologist

feels that there are stones in the right kidney pelvis.

Tumor

12-2-31 - Exploration of right kidney with the intention of nephrotomy for the removal of stones. When the kidney is exposed, a large hypernephroma, about 7 cm. in diameter, is found in the lower pole. A right nephrectomy is done. Examination of kidney - circumscribed grayish, partly necrotic tumor occupying the lower two-thirds. There is a stone, 2 cm. in diameter, as well as several small calculi in the pelvis. Microscopic examination - shows compact cords of clear cells which are well demarcated from the rest of the kidney tissue. The nuclei are hyperchromatic. There is considerable necrosis.

Diagnosis: Nephrolithiasis, carcinoma of kidney, clear cell type.

V. MORE INFORMATION PLEASE

In writing letters to referring physicians some reports are long and others short. Some of our friends like one kind, and some another. In any event the diagnosis should be included. Our attention has been called to some letters in which no diagnosis was included. Some of them referred to patients in which the differential possibilities were not even mentioned. The physician back home is frequently asked his opinion of our findings. It is rather difficult to express such an opinion if we do not offer one.

VI. MOVIES

Title: Slime Molds

Produced by: Harvard University Film Foundation.

VII. GOSSIP

The official University Spring Quarter starts April 1st. In the Medical School it is March 18th. The Spring Vacation is the week of March 24th. There will be no Staff Meeting that week.....A Short Course on Monday and Tuesday may be offered to practicing physicians if there is sufficient interest. One was offered last Spring and Fall.....Logan Clendenning will give the Clarence Jackson lecture March 8th in the Auditorium. With Alexander Woollcott also coming in the Winter Quarter a welcome relief will be provided for those who enjoy real wit and humor.....According to newspaper reports Minnesota students are growing "serious." Our school is listed as one of the few showing a critical attitude toward its curriculum and teaching methods. The medical students have long wondered when the epidemic would spread to our side of the Campus.....The increase in size of the spectator space in the New Athletic Building has already resulted in marked interest in swimming meets. Those who attended the opening were most enthusiastic.

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BIRTHDAY! BIRTHDAY!

Today we give you Dr. William A. O'Brien, just (barely) turned forty-two; famed the length and breadth of the land as the Town Crier of the Medical Profession. To him goes the credit for what success these meetings have had. Banzai, Dr. O'Brien!