Staff Meeting Bulletin
Hospitals of the » » »
University of Minnesota

Vesical Calculi

Volume X | Friday, March 10, 1939 | Number 20

STAFF MEETING BULLETIN
HOSPITALS OF THE . . .
UNIVERSITY OF MINNESOTA

Volume X | Friday, March 10, 1939 | Number 20

INDEX

Published for the General Staff Meeting each week during the school year, October to May, inclusive.

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William A. O'Brien, M.D.

I. LAST WEEK

Date: March 3, 1939

Place: Recreation Room
Powell Hall

Time: 12:15 to 1:15 P.M.

Program: Movie: "Donald and Pluto"

Announcements

Spinal Cord Tumors
William T. Peyton
Leonard Titrud

Discussion
J. C. McKinley
Harold Peterson
L. G. Rigler
William T. Peyton

Present 136

Gertrude Gunn
Record Librarian

II. MOVIE

Title: "Nostradamus"

Released by: M-G-M

III. ANNOUNCEMENTS

1. EVA DAWALT

Secretary to Dr. Boynton of the Students' Health Service, died Monday, March 6, at 9:30 a.m. Miss Dawalt had been ill for over four weeks from the effects of a cerebral hemorrhage. She was unconscious during the entire period. Funeral services were held Thursday, March 9, at 3:30 p.m. with the Rev. N. D. Darrell officiating. Interment was in Lakewood Cemetery. Miss Dawalt came to the University of Minnesota in 1920. For six years she was secretary in the Department of Sociology, and since 1926 has been connected with the Health Service. She was a native of Indiana and a cousin of the late President Lotus D. Coffman.

Miss Dawalt was a cheery soul with a good philosophy of life. Office visitors seldom found her officious or depressed. Her absorbing avocation was baseball. During the winter months there was time to read of her favorite sport, but when spring came, she went to a game whenever possible. She liked the game for its own sake. Her outside interests did not mean that her friends were forgotten. She indulged in much knitting and rug making.' One of her objects of art was a rug in which Superintendent Amberg's discarded trousers played an important role. Aside from the Coffman's, her only near relatives were a niece and nephew in California. Miss Dawalt will be missed by many friends. Aware of the fate that her vascular heredity had in store for her, she went ahead and faced the outcome with courage and optimism. Her family history told her about when to expect her illness and her predictions were very close. The picture of the hen and chickens over her desk was always pointed out to visitors as symbolic of her place in the department or her personal characteristics, whichever version you care to take. In her contact with various departments in the University, she was at all times tolerant and courteous. Her life had good teaching value and some of its lessons will linger long with her friends and associates.

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2. POST-GRADUATE COURSE

NERVOUS AND MENTAL DISEASES

Center for Continuation Study
March 13 - 18, 1939

Monday, March 13
- 9:00 - 10:00 Introduction - Mr. Nolte, Dr. O'Brien, Dr. McKinley
- 10:00 - 12:00 History and Physical Examination - Drs. McKinley, Skoglund, and Cottrell
- 2:00 - 4:00 Testing Methods - Staff
- 4:00 - 4:30 Tea
- 4:30 - 6:00 Cerebral Localization - Dr. McKinley

Tuesday, March 14
- 9:00 - 10:30 Clinic - Ancker Hospital - Syphilis - Dr. Hammes
- 10:30 - 12:00 Clinic - Ancker Hospital - Psychoses - Dr. Whitmore
- 2:00 - 3:00 Radiologic Diagnosis of Cerebral Lesions - Dr. Peterson
- 3:00 - 4:00 Mild Depressions - Dr. Heersema
- 4:00 - 4:30 Tea
- 4:30 - 6:00 Epilepsy - Dr. McQuarrie

Wednesday, March 15
- 9:00 - 10:30 Clinic - Minneapolis General Hospital - Schizophrenia - Dr. Michael
- 10:30 - 12:00 Clinic - Minneapolis General Hospital - Presenile and Senile Conditions - Dr. Hannah
- 2:00 - 3:00 Spinal Cord Tumors - Dr. Peyton
- 3:00 - 4:00 Ruptured Disc - Dr. Craig
- 4:00 - 4:30 Tea
- 4:30 - 6:00 Round Table - Low Back Pain - Drs. Cole, Evans, Craig, McKinley, Creevy, and McKelvey

Thursday, March 16
- 9:00 - 10:30 Clinic - Ancker Hospital - Myelitis, Muscular Dystrophy - Dr. Kamman
- 10:30 - 12:00 Clinic - Ancker Hospital - Affective and Involutional Changes - Dr. Ruhberg
- 2:00 - 4:00 Demonstration - Child Psychiatry Clinic - University of Minnesota Hospitals - Dr. Clarke and Associates
- 4:00 - 4:30 Tea
- 4:30 - 6:00 Psychoneuroses - Dr. Schiele

Friday, March 17
- 9:00 - 10:30 Clinic - Minneapolis General Hospital - Psychoses - Dr. Berkwitz
- 10:30 - 12:00 Clinic - Minneapolis General Hospital - Encephalitis, Meningitis - Dr. Blumstein and Associates
- 2:00 - 3:00 Peripheral Neuritis - Dr. Woltman
- 3:00 - 4:00 Diagnosis of Brain Tumors - Dr. Woltman
- 4:00 - 4:30 Tea
- 4:30 - 6:00 Brain Trauma - Dr. Baker

Saturday, March 18
- 9:00 - 12:00 Clinic - Neuropsychiatric Unit, University of Minnesota Hospitals - Dr. McKinley and Associates

3. POST-GRADUATE COURSE

DISEASES AND INJURIES OF BONES AND JOINTS

Center for Continuation Study
March 13 - 18, 1939

Monday, March 13
- 9:00 - 10:00 Introduction - Mr. Nolte, Dr. O'Brien, Dr. Cole
- 10:00 - 12:00 Demonstration - Surgical Anatomy - Dr. Cole
- 2:00 - 3:00 Radiologic Anatomy - Dr. Rigler
- 3:00 - 4:00 Physiology of Bones and Joints - Dr. Cole
- 4:00 - 4:30 Tea
- 4:30 - 6:00 History and Physical Examination - Dr. Hart

Tuesday, March 14
- 9:00 - 12:00 Clinic - Gillette State Hospital for Crippled Children - Drs. Chatterton, Williamson, and Moe.
- 1:30 - 3:00 Demonstration - Injuries of Sport, Training Quarters, Athletic Department - Dr. Hauser and associates
- 3:00 - 4:00 Injuries of Shoulder and Knee - Drs. Macey and Henderson
- 4:00 - 4:30 Tea
- 4:30 - 6:00 Round Table - Joint and Soft Tissue Injuries - Dr. Henderson and associates

Wednesday, March 15
- 9:00 - 12:00 Clinic - Minneapolis General Hospital - Fractures and Dislocations - Drs. White, Henrikson, and Moe
- 2:00 - 3:00 Back Injuries - Dr. Evans
- 3:00 - 4:00 Ruptured Disc - Dr. Craig
- 4:00 - 4:30 Tea
- 4:30 - 6:00 Round Table - Low Back Pain - Drs. Cole, Evans, Craig, McKinley, Creevy, and McKelvey

Thursday, March 16
- 9:00 - 12:00 Clinic - Ancker Hospital - Fractures and Dislocations - Dr. Colvin and associates
- 2:00 - 3:00 Osteomyelitis - Dr. Frank C. Dickson, Kansas City
- 3:00 - 4:00 Pyogonic Arthritis - Dr. Dickson
- 4:00 - 4:30 Tea
- 4:30 - 6:00 Round Table - Pyogenic Gonorrheal and Rheumatoid Arthritis - Drs. Dickson, Spink and Wetherby

Friday, March 17
- 9:00 - 12:00 Clinic - United States Veterans' Administration Facility, Adult Orthopedic Lesions, Fractures, and Dislocations - Dr. Evans and associates
- 1:30 - 3:00 Bone Tumors - Drs. Ghormley and Stenstrom
- 3:00 - 4:00 Metabolic Bone Disorders - Dr. Camp
- 4:00 - 4:30 Tea
- 4:30 - 6:00 The Feet - Dr. Cole

Saturday, March 18
- 9:00 - 12:00 Clinic - University of Minnesota Hospitals - Drs. Cole, Wangensteen and associates

IV. VESICAL CALCULI

Frank D. Naegeli

History

The story of urinary lithiasis dates back to the dawn of civilization. Probably the earliest known specimen of vesical calculus was discovered in the grave of a predynastic and prehistoric Egyptian by Professor Elliot Smith[2] at El Amara. He considered it to be about 7000 years old. It is probable that urolithiasis was not common among the ancient Egyptians since in 9000 mummies Professor Smith examined he found but 3 stones, 2 of which were probably renal.

There is no mention of stone in the Ebers papyrus[1], considered the oldest medical treatise in existence and written about 1550 B.C. The papyrus consists, however, more of a list of prescriptions than of descriptions of diseases and 'dysuria' is the only urological term in it; although prescriptions to "regulate the course of urine," to "evacuate an accumulation of urine," and to prevent a "too rapid escape of the urine" are found.

Stone is mentioned in early Hindoo writings, the Rig Veda and Atharva Veda, dating around 200 B.C. Suprapubic lithotomy was described in the Ayur Veda 1600 years ago, and as early as 700 A.D. 4 types of stone were recognized.

Hippocrates recognized both renal and vesical calculi and gave the first description of renal colic. He gives 5 symptoms of stone in the bladder:

1. Pain on urination
2. Emission of urine, drop by drop, as in strangury.
3. Blood-stained urine
4. Inflammation of the bladder
5. Expulsion of gravel with the urine

The first attempt at instrumental removal of a vesical calculus was made by Ammonius two centuries after Hippocrates.

The epoch of the Renaissance started with the discovery of printing in 1450 A.D. During this period many of Galen's anatomical doctrines, which had been law during the Middle Ages, were proved false by Vesalius; and his surgical dicta superseded by those of Paré, who first completely described the symptoms of prostatic hypertrophy.

Perineal lithotomy was practiced among the Greeks, Romans, Arabians, and early French and English by traveling lithotomists who frequently became fugitives following performance of the operation.

While the existence of vesical calculi has been recognized for centuries, the last fifty years alone have produced therapeutic measures capable of reducing the mortality following operation from 15.25% in 1873 to 2.2% in 1924 (Swift Joly)

Sex

Stone in the bladder is predominately a disease of the male, in which it is fifty times commoner than in the female. This can be accounted for by the fact that obstruction of the vesical neck, urethral stricture, and vesical diverticulum are primarily diseases of the male. Principal causes of vesical calculus in the female are renal stones passed into and retained in the bladder, encrusted tumors, cystitis, and very occasionally diverticula and obstruction at the vesical neck.

Race

Vesical calculus is rather commonly found in countries where diets are deficient in certain essential dietary elements, chief among which is probably Vitamin A. Among these countries are Siam, Southern China[13], and India. In the United States bladder stone is very uncommon in the Negro. Reaser[5] in 5900 autopsies found 79 vesical calculi, 5 of which were in Negroes. This was decidedly out of proportion to the ratio of

Negroes to whites in the series.

Age

In any discussion of the age of patients with stone in the bladder it must be clearly stated to which part of the world one refers. Noble[6], studying the incidence in Siam, found them most frequent in children. Price[7] observed 125 cases in 5 years in Shantung province; the great majority occurred in boys between the ages of 5 and 15. A similar situation existed in Europe 100 years ago. Thus Civiale[8] in France, and Gelloly[9] in England, referred to vesical calculus as a disease of childhood. Precisely the reverse of this situation is now true both in Europe and in America, where stone in the bladder is a disease of late life. Caulk's[10] recent study showed his patients to be between the ages of 40 and 70. Cabot's[11] experience has been similar to that of Caulk. This statement should not, however, be construed to mean that stone is never found in childhood. Recently Thomas and Tanner[12] collected 203 cases of urolithiasis in which the average age was 7.8 years. 57% of the calculi were located in the bladder; 14% were renal, 7% ureteral, 8% urethral. They assume, however, that all stones found in the bladder, or lesion of the spinal cord, originated in the kidneys.

In like manner there exists a considerable variation in the relative frequency of renal and vesical stones in various parts of the world. Whereas in Noble's[6] series of 226 cases of stone only 5 were renal, and in Thompson's[13] 2962 cases in Canton, China only 5 were renal; in America today stones are commoner in the kidney.

Physiological Chemistry

Urinary calculi are formed of two distinct types of substances: crystalline and colloid.

The principal crystalline constituents of urinary calculi may be classified as follows:[14]

1. Uric acid, and urates of sodium, potassium, ammonium, and magnesium.
2. Calcium oxalate.
3. Phosphates - they are always salts of orthophosphoric acid and two types are distinguished:
   a. Mono-calcium phosphate - usually found in amorphous form but occasionally in long needles - the reaction of the urine determining the form of the deposit.
   b. Ammonium magnesium (triple) phosphate deposited as the result of the action of urea-splitting organisms.
4. Calcium carbonate.
5. Cystine - found normally in minute quantities in normal urine, but under conditions of abnormal metabolism, excreted in quantities sufficient to form calculi.

It is well known that the stone forming salts present in the urine are all sparingly soluble; and normal urine is a supersaturated solution. For example, at a temperature of 37 C. 1 gm. of uric acid is soluble in 25 liters of water, yet approximately this amount is excreted in the urine daily.

It is possible to obtain supersaturated solutions of various salts in pure water, but these solutions are very different from those occurring in the urine. It is difficult to obtain a supersaturated aqueous solution which holds more than twice the normal amount of the salt in the solution, yet this proportion is greatly exceeded in the urine. Further, if a crystal of the dissolved salt is added to a supersaturated aqueous solution, the whole of the excess crystallizes out and a solution of normal strength is left behind. If, on the other hand, a specimen of urine throws down a deposit of uric acid of calcium oxalate, the whole amount of the excess is never found in the deposit and the filtered urine is still supersaturated. This phenomenon is due to certain colloids, the presence of which in the urine can be proved by dialysis. The crystalloids will pass through the walls of a semi-permeable membrane, while the colloids remain behind. If the resulting solution of

crystalloids is slowly evaporated down, a copious deposit will form long before the solution is concentrated to the original volume of the urine. This deposit consists of a mixture of uric acid, calcium oxalate, and calcium phosphate. Again, it is impossible to create an artificial urine by mixing together the various crystalloids in the proportions in which they are found in normal urine. Such a mixture throws down a deposit.

It has been postulated that the protective action of the urinary colloids simulates that of Lange's colloidal gold reaction.

Although it has long been known that urine contains a small amount of colloidal substances, our knowledge of their identity and composition is still incomplete. Lichtwitz[15] found an average of 0.83 mg. of colloid per liter of urine. The amount varies greatly with the quantity of protein in the diet. Substances isolated include mucin, nucleic acid, and chondroitin sulphuric acid.

The origin of these colloids is still obscure and it has been suggested that they have their origin in the renal cells themselves (Swift Joly). The only other possible source is the blood stream.

If the protective power of the colloids is abolished or appreciably diminished a precipitate will form in the urine. Other conditions, such as temperature and the reaction of the urine, influence the nature of the deposit, but do not prevent its formation.

Many individuals pass crystals daily for years without developing a calculus, though they are in constant danger of doing so. Such a situation presupposes complete elimination of the crystals, for their retention in the urinary tract might provide the nidus of a stone. The production of stasis anywhere along the urinary tract of such a person supplies a factor conducive to stone formation. Stasis and its frequent sequel infection produce an ideal environment for the precipitation of crystals and growth of calculi.

Etiology

The etiology of urolithiasis is far from clear. Investigation has, however, led to the belief that two principal factors, working either singly or in concert, are responsible in most instances.

Albarran[26] has divided calculi into primary stones and those secondary to infection. Primary stones include uric acid, urates, and calcium oxalate, deposited in acid urine; as well as crystalline calcium carbonate and phosphate precipitated from fairly alkaline or neutral urine. Primary stones have been held to be aseptic but this is not altogether consistent with clinical findings, although it is possible that they may be sterile when their formation commences.

Abundant experimental and clinical evidence supports the belief that aseptic calculi may form as the result of various metabolic disorders. Keyser[16] produced artificial lithiasis in animals by feeding oxamide and subsequently produced calcium oxalate stones in rabbits by feeding large amounts of calcium oxalate and causing concentration of the urine by dehydration. Calcium phosphate stones have similarly been produced by excessive doses of parathormone and viosterol. Clinically, the frequent occurrence of urinary stones in patients suffering from hypercalcemia and hypercalcinuria as the result of hyperparathyroidism, is evidence confirmatory of this fact[17, 18].

Diets deficient in Vitamin A produce calculi of calcium phosphate in the kidneys of rats and dogs, as shown by Osborn, Mendel and Ferry[19], Fujimaki[31], and Van Leersum[20], but the clinical significance of these experimental findings is not yet clear, although Swift Joly[21] has attempted to explain the geographical variation in incidence of stones on this basis. He has been able to trace a dietary vitamin deficiency in those districts in China, India, and England in which urolithiasis is most prevalent. He feels that the diminished incidence of calculus in children of highly civilized

races during the past 50 years has been accomplished by better hygiene and an appreciation of the importance of a diet rich in vegetables and vitamines.

Cystine calculi are associated with an inborn error in metabolism in which cystine, the sulphur-containing amino-acid, instead of being converted to sulphates, as normally happens, is excreted as such by the kidneys. Likewise fatty (urostealith), indigo, and cholesterol stones presume a metabolic error as the cause of their formation.

Secondary calculi are composed of ammonium magnesium phosphate and amorphous calcium phosphate and carbonate precipitated in alkaline urine. They are found associated with urea-splitting organisms which, in addition to lowering the hydrogen-ion concentration, act in some biologically specific manner to cause the precipitation of stone forming crystals.

Certain types of organisms, when present in the urinary tract, have a propensity for causing stone formation. Rosenow and Meissner[22] produced calculi in dogs by implanting into their devitalized teeth streptococci from the infected teeth of patients with recurrent lithiasis. Hager and Magath[23] developed alkaline encrusted cystitis and vesical calculi in the bladder of guinea pigs with B. Proteus ammoniae from the urine of stone-forming patients. Keyser[24] similarly reports experimental lithiasis by infection of the rabbit's bladder with streptococci from the urine of patients with rapidly forming calculi. Closely paralleling this experiemntal evidence is the fact that stones formed in alkaline urine are almost constantly associated with urea-splitting bacteria.

Calculus may start as an aseptic primary stone and secondary infection may subsequently occur producing deposition of phosphates on the primary stone as a nucleus. Lamination of calculi is thus explained.

Urostasis in itself is not a cause of stone formation, but in producing the "fertile ground" for urinary infection, is a factor of supreme importance. Keyser[27] produced in animals a degree of urostasis insufficient to interfere with renal secretion. The animals on being fed with oxamide deposited an amount on the obstructed side far in excess of that on the unobstructed side. Crenshaw and Crompton[29] reviewed a series of 222 diverticula of the bladder in which calculi were present in the diverticulum, the bladder, or both in 28 cases (12.1%).

In regard to the origin of vesical calculi a number of interesting questions arise. Whether their nuclei originate as renal stones which by some chance are retained in the bladder or whether they arise primarily in the bladder, has been a long-debated point. Undoubtedly both points of view are correct, depending upon the conditions present, but the rapidity with which they form in some persons and the infrequent demonstration of their renal origin suggests that the majority form primarily in the bladder[28].

Symptoms

Frequency of micturition is more consistently present than any other symptom, and is often so extreme that the patient must void every few minutes. There may be such a degree of tenesmus that the bladder is in an almost constant state of spasm.

Hematuria is common and its appearance in an elderly male with urinary obstruction should suggest possible co-existence of vesical calculus. The termination of micturition is usually accompanied by hematuria and strangury as the full weight of the stone comes to rest upon the base of the bladder, stimulating the latter to contract and grasp the stone.

Not infrequently the patient will describe sudden termination of micturition and state that he is able to continue the act with ease upon assuming the recumbent or some other position. This dramatic episode is due to the sudden occlusion of the internal urinary meatus by the calculus.

Pain is usually present when a stone of any size exists in the bladder. Frequently pain is decreased or absent when the bladder becomes filled, due to cushioning by the urine; or when the patient assumes the recumbent position since at such times the stone leaves its lacerated bed and rests upon other less irritable areas of the vesical mucosa. Increased pain is produced by any sudden jolt, such as stepping off a curb or riding horseback, either of which may thrust the stone against the inflamed base of the bladder.

Treatment

The history of treatment of stone in the bladder dates back to the recognition of this condition as a disease entity. Efforts have been made to remove vesical calculi by various surgical procedures and by the oral administration of substances thought to possess lytic properties (lithotryptics). The latter have failed. Brevity forbids a complete enumeration of the contributions to treatment of vesical calculus and only the most outstanding will be mentioned. The writings of Swift Joly and Cabot contain excellent descriptions of these early operations and of the instruments with which they were performed.

The operation of median perineal lithotomy was mentioned several centuries B.C. Who first performed the operation is not known.

Two centuries after Hippocrates, Ammonius made the first attempt to break or crush a calculus in an effort to facilitate its removal through a perineal incision.

Celsus, first great Roman surgeon, left detailed instructions and described an elaborate armamentarium for the performance of perineal lithotomy; he described the procedure of catheterization and constructed excellent metal catheters. As regards vesical calculus, Galen followed in the footsteps of Celsus and contributed nothing new.

Albucasis, an Arabian, invented a bistuory which was widely used for many years. The instrument was passed through the urethra with the idea of boring a hole in the stone; if this failed the surgeon cut down on the stone.

Early in the Sixteenth Century the so-called "grand appareil" (i.e., lithotomy with a staff) was first executed by Morianus Sanctus, who described the operation and the instruments necessary to perform it.

Development of subsequent improvements in the operation of lithotomy occurred chiefly in France where Pierre Franco performed the first suprapubic lithotomy in Europe; he also anticipated by 250 years the lithotome of Dupuytren.

Not till 1818 was an instrument employed to crush vesical calculi through the urethra. This instrument was the "trilabe" designed by Civiale. The instrument was improved in 1832 by Huerteloup and provided with a screw mechanism by Hodgson of Birmingham. Sir Philip Crampton of Dublin constructed the first suction apparatus to evacuate the stone fragments from the bladder. The instruments in common use today are chiefly the product of that mechanical gemius, Bigelow of Boston[4]. In 1923 Goldstein and Lutz[33] advocated lithotrity under direct observation through the telescopic system of the cystoscope and instruments developed for this purpose by Ravich, Kirwin, and Young are widely used.

Modern treatment has two principal forms, litholapaxy and suprapubic lithotomy. A brief summary of the indications for each follows:

In choosing the operation it is necessary to consider the following factors:

1. The condition of the patient.
2. The size and type of stone present.
3. The size of the urethra, prostate, and bladder.
4. The removal of the lesion which predisposed to the calculus.

Very large stones which cannot be grasped with the lithotrite and stones whose hardness defy crushing must be removed by the suprapubic route. It is

generally agreed that stone forming about a metallic foreign body is also best removed by suprapubic cystotomy. Small bladders, contracted as a result of long-standing infection, which do not permit introduction of sufficient fluid for a litholapaxy, stricture of the urethra which can not be dilated sufficiently to permit passage of a lithotrite; and stones in the bladders of small children; all are indications for suprapubic lithotomy.

A patient who is in poor condition will probably stand litholapaxy much better than suprapubic lithotomy. Keyes Sr. said many years ago "of all the operations that are or have been employed in the treatment of stone in the bladder, litholapaxy, when properly performed, is generally conceded to be the safest and most brilliant." As regards the actual mortality, Caulk in a series of 112 cases of litholapaxy reports 1 death, 0.89%; in 32 cases of simple cystotomy there was 1 death, 3.1%.

In some instances suprapubic cystotomy has been performed and the patient returns with stones; or a suprapubic cystostomy may have been formed to afford relief from the urinary stasis and infection so frequently associated with neurogenic vesical dysfunction - a situation in which vesical calculi are prone to form. In such cases the fistula may often be dilated and the stone or stones removed with forceps.

Diverticulum of the bladder is not infrequently the cause of vesical calculus formation and, if overlooked, may result in recurrent formation of stones; in such situations suprapubic removal of the stone and diverticulum are best accomplished simultaneously. A number of other vesical lesions, to which vesical calculi are coincident, require treatment via the suprapubic route and lithotomy is therefore most easily accomplished during the performance of the principal procedure; among these are bladder tumors.

With the advent of X-ray and the cystoscope many stones may be diagnosed and removed before they reach great size.

The development of transurethral resection has in many cases obviated the performance of suprapubic lithotomy and prostatectomy with its attendant high mortality. Many of the stones in this series were removed in toto through the sheath of the 28F. resectoscope. Other stones were crushed, their fragments removed through the sheath of the resectoscope, and a transurethral resection completed at a single sitting. The patients are frequently up and about on the 2nd to the 4th postoperative day and home in ten days with the stone and the cause of their urinary obstruction gone. No one can dispute the superiority of such a procedure when one considers the long stay in bed and the variety of postoperative complications which suprapubic lithotomy, with or without prostatectomy, usually involves.

Mortality

Watson and Cunningham[32] have collected 33,871 cases of vesical calculus, irrespective of age in which the patients were operated upon by the following methods:

	Cases	Mortality
By litholapaxy	17,736	2.4%
By lateral perineal cystotomy	11,963	9.8%
By median perineal cystotomy	425	13.7%
By suprapubic cystotomy	3,303	13.2%

VESICAL CALCULI

University of Minnesota Hospitals

Since 1930 the diagnosis of vesical calculi has been made in 98 patients admitted to the University Hospitals.

Age and Sex

Sex	Average Age
Females	49.5
Males	63.7 (19-89)

Age according to decades

Decade	Number Patients
11 - 20	1
21 - 30	2
31 - 40	4
41 - 50	4
51 - 60	16
61 - 70	36
71 - 80	31
81 - 90	4

Lesions of the lower urinary tract incident to, or contributory to formation of the vesical calculi were the following:

Lesion of Lower Urinary Tract	Number of Cases
Benign Prostatic Hypertrophy	50
Carcinoma of Prostate	6
Contraction of Vesical Neck	12
Carcinoma of Bladder	5
Neurogenic Vesical Dysfunction	6
Diverticulum of Bladder	16
Encrusted Cystitis	2
Stricture of Urethra	3

Obstruction at the vesical neck or in the urethra was demonstrated in 71% of the cases and urostasis was present in the lower urinary tract in 88%.

The following lesions of the upper urinary tract were demonstrated:

Lesion	Number of Cases
Hydronephrosis	4
Bilateral hydronephrosis	2
Pyelonephritis	4
Hypernephroma	1
Renal Calculus	7
Ureteral Calculus	5

There was a history of previous renal colic in 10 instances and 3 of these patients had passed stones. In 5 instances patients passed stones without previous renal colic.

The following pathological conditions, unrelated to the urinary tract, were encountered in this series of patients:

Heart disease: 6 patients, one of whom had a previous stroke.
Diabetes Mellitus: 4
Inguinal Hernia: 4 - bilateral in 2.
Cholelithiasis: 1
Ischiorectal abscess: 1

7 patients were uremic at the time of admission.

44% of the patients had a systolic blood pressure of 140 mm. of mercury or higher, and

20% had systolic pressures of 160 or over.

Symptoms

A history of hematuria was noted in 51% of the cases, in most of which the hematuria appeared at the conclusion of urination and frequently was accompanied by severe dysuria, strangury, and suprapubic pain. Sudden interruption of the urinary stream was a rather common occurrence.

Diagnosis

The diagnosis of vesical calculus was made clinically (prior to the making of an X-ray) in 5%, by cystoscopy in 30%,

and by X-ray in 65% of these patients.

Previous Operations

Thirty one (31.6%) of the patients had had a total of 59 operations upon the urinary tract elsewhere prior to removal of vesical calculi in this hospital. Of these there were 42 suprapubic operations for prostatectomy, lithotomy, or both; 5 punches had been performed; twice suprapubic operations had been followed by a punch and once a punch was followed by a suprapubic lithotomy; tumors of the bladder had been excised 3 times and fulgurated transurethrally twice. One patient had had a ureterolithotomy. The average length of time elapsing between the last previous operation and diagnosis of vesical calculus here was 26.1 months in this group of patients.

Treatment

In summarizing the treatment of these patients it is interesting to note that suprapubic lithotomy and prostatectomy have been almost totally replaced by litholapaxy and transurethral resection. The various types of treatment, average hospital stay, mortality, and percentage of cases in which there was a recurrence of vesical calculi, are presented in the following table. Three patients who expired before receiving any treatment directed at the removal of their vesical calculi are excluded from this group of cases.

Type of Operation	Times	Average Hospital Stay	Died	% Mortality	% Recurrence
Litholapaxy	45	3.8	0	0	15.5
Litholapaxy + Punch	26	13.6	1	3.5	19.2
Litholapaxy failed; S.P. Lithotomy	4	31.7	0	0	0
S.P. Lithotomy and Diverticulectomy	3	35.0	0	0	0
Suprapubic Lithotomy	23	18.7	3	15.0	4.3
Suprapubic Prostatectomy + Lithotomy	3	50.4	1	33.3	0
Average	104	12.9	5	4.8	13.5

There were 13 cases of recurrence of vesical calculi following removal here. In 6 instances the lesion predisposing stone formation had been removed; in 2 cases this operation had been performed elsewhere prior to patient's first admission here. In 7 instances the lesion predisposing to stone formation had not been removed prior to the recurrence of the stone; carcinoma of bladder was present in one case, diverticulum in 1 case, the stones were all coming from the kidneys in 3 cases, 1 patient refused transurethral resection, and 1 patient is awaiting a transurethral resection.

In all there were 8 deaths in this series, a case mortality of 8.16%. If we exclude 3 cases in whom no operation for the removal of calculus was performed prior to death the mortality becomes 4.8%. A brief summary of the deaths which occurred in this series follows:

1. [redacted], Age. 66. Had a suprapubic cystotomy 3 years before and a punch 2½ years before. Upon admission his N.P.N. was 100 mg. percent. He died

2 days after admission without operation. Autopsy revealed bilateral pyelonephritis.

2. , Age 73. Admitted with bulateral pyelonephritis, urinary retention and uremia. His N.P.N. was 165 mg. percent. He died 10 days after admission without operation. No autopsy.

3. , Age 58. On July 6, 1933, a diagnosis of carcinoma of the bladder was made. On July 13, 1933 radon was implanted. Between July 13 and July 26 he received deep X-ray treatments. September 7, 1933 - September 20, 1933 had radon implanted and deep X-ray treatments. On December 18, 1933 diagnosis of vesical calculi was made by X-ray and metastases from the tumor of the bladder were found in the spine. On January 13, 1934 he died without an operation. Autopsy revealed stones in the bladder and in a diverticulum, and a large infiltrating tumor of the bladder with metastasis to the spine.

4. , Age 80. Had benign prostatic hypertrophy and a vesical diverticulum and calculus. Litholapaxy on June 30, 1933, following which he refused to have a transurethral resection. Two years later recurrence of vesical calculi were found; removed by suprapubic lithotomy. The patient died on the 9th postoperative day of pyelonephritis and wound infection. No autopsy.

5. ., Age 72, Diabetic. Patient had transurethral resection in two stages separated by an interval of 3 days. During the second stage of the transurethral resection, litholapaxy was performed. The patient died on the 14th postoperative day. Post-mortem diagnoses: 1. Benign prostatic hypertrophy. 2. Prostatitis with superficial gangrene. 3. Pyelitis. 4. A possible nephroma of the left kidney.

6. , Age 47. Suprapubic lithotomy. Seven days postoperatively the patient developed multiple lung abscesses from which he died on the 48th postoperative day. No autopsy.

7. ...., Age 62. Suprapubic lithotomy for a large stone. Four days later a transurethral resection with the removal of 26 grams. Death 14 days later. Autopsy disclosed bronchopneumonia, a diffuse gangrenous cholecystitis, and general peritonitis.

8. , Age 89. Suprapubic prostatectomy and lithotomy. Died on the 18th postoperative day. Post-mortem revealed congenital polycystic kidneys.

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V. GOSSIP

The age of specialization is evident all about us. Social service, which once confined its "service" to the problems of poverty now offers specialized assistance in the following fields: family service and adjustment; psychiatric service; behavior clinics; medical social service; group relationships; child care and placement; treatment of delinquents; big brother and big sister service; and probation and parole service. In the hospital family there is the same tendency toward specialization. One of our junior staff men was complaining the other day of the passage of the good old days when interns and junior staff men on one service invited their friends from another service to come over and see an interesting case. In spite of this we probably "work together" with less friction and more wholehearted enthusiasm than most organizations of our type. There are advantages in cultivating their specialized interests. A visit to any one of our staff conferences will convince the skeptic that there is much to be gained from working together in a narrow field. Replacing to a large extent the old type of ward rounds, the new staff conferences emphasize studies of special cases. Occasional hospital visitors will find any one of these conferences an enjoyable, scientific experience....Distinguished Service Professor Richard E. Scammon, one time member of the department of Anatomy and former dean of Medical Sciences, is known to the graduates of a decade ago as one of Minnesota's best teachers on the medical campus. After an absence in administrative fields Dr. Scammon has again returned to his first love and is packing them in with his courses for freshmen entitled "Measurement in Medicine" and for graduates and others in delightful excursions into the field of medical history. New staff members should become acquainted with these unique opportunities to learn with Dr. Scammon. In the old days his two-handed color drawings in embryology which accompanied his verbal evolution of the growing embryo are still remembered. It is interesting to note that students who took his course as undergraduates returned to take it again after going out into practice. The Medical School is going modern. One of the innovations in this year's program is a cooperative presentation of the practical aspect of the practice of medicine. The agencies are the Minnesota State Medical Association and the Medical School. Much good can be accomplished in this way, but a great deal must be learned in the school of practical experience. It is said that exophthalmic goiter is staging a comeback. Students of the goiter problem suggest that exophthalmic goiter, at one time common and easily recognized, may be a diagnostic problem. Perhaps this is the reason that the goiter experts are seeing more of them. It is interesting to speculate as to what may happen if the new sulfanilamide preparations solve the problem of pneumonia therapy. One commercial house stands ready to lose over a million dollars if the drug comes through. Physicians, like other humans, find it difficult to follow directions. Many of the great advances in medicine are the result of pains-taking fundamental and clinical research. Those who attempt to use this new knowledge frequently give it an individualistic interpretation. The result too often is that the pains-taking research cannot be repeated and there is another delay in medical advancement. It is said that one third of all patients with syphilis undergo spontaneous cure. Only one-third are helped by hit-and-miss treatment. Much of the advance in surgery has been in preparing the patient for operation and dealing with his postoperative condition in the light of modern biochemistry, physiology, and pharmacology. The control of hemorrhage and jaundice by vitamin K is splendid example of how research is "applied." Clinics using identical methods of handling jaundice patients report uniformly good results. Others who "try it" cannot understand such enthusiasm...Spring will soon be here. The world looks rather dark and gloomy at the present time with wars and rumors of wars. The calendar makers apparently sensed the annual depression and dropped in St. Patrick's Day which will be appropriately celebrated next week.

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