X-RAY OF THE URINARY TRACT, WITH REPORT OF A CASE OF CONGENITAL UNILATERAL KIDNEY

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Review of literature.
Technic of combined radiologic and urologic diagnosis discussed.
For literature quoted, see Quarterly Cumulative Index, A. M. A., or Index Medicus.
Frank discussion by George W. Hartman, San Francisco; H. E. Ruggles, San Francisco; Edward N. McKee, Los Angeles; Charles M. Richards, San Jose.

THE manner of examining the urinary tract with the x-ray, may, like ancient Gaul, be divided into three parts. First, films taken without cystoscopy and catheterization of the ureters. Second, films taken after cystoscopy and the catheterizing of the ureters. And third, films taken after an opaque media has been thrown into the kidney cavities and the ureters. This same opaque media injected into the bladder ofttimes will give us useful information.

Good films of the urinary tract should show the outline of the kidney shadow, the border of the psoas muscle, the lower ribs, and the transverse processes of the lumbar vertebrae, and the lower part of the tract, the pelvis must be well shown also. From films made when the ureters have not been catheterized, we are able to get information regarding the position of the kidney in its relation to the surrounding body structures, the size of the kidney, and whether or not there is any opacity casting a shadow suggestive of a calculus. Before such a shadow is diagnosed as being a calculus, the relation of the shadow to the position of the other shadows of the urinary tract must be considered.

With the ureters catheterized, using a catheter that is opaque to the ray, with a single film the relation of any opacity to the urinary tract may be fairly well located. With shifting of the tube between exposures and a double exposure on the same film, or with stereo films, the location may be made more exact. In the case of a shadow of an opacity near the ureter, it must always be borne in mind that the ureter may be very much dilated, and a calculus within the ureter in such a case may not be in contact with the catheter. In these cases a final diagnosis must be made only after a good ureterogram has been made, using an opaque media in the ureter.

The most information regarding the urinary tract is obtained when the entire tract is filled with an opaque solution. The shadow of this opaque solution gives us the size, shape, and position of the various parts of the tract. Various anomalies are found with these films that otherwise would not be known. A kidney may give a good function test and at the same time be discharging much pus. When the roentgenogram is made it is found that there is a double pelvis in the kidney, one of which only is functionless. With two films or a double exposure on the same film after shifting the tube, it is possible to determine strictures of the tract. Pathological changes may take the form of contractures, displacement of the media by new growths, or dilatation of the pelvis, calex, or ureters.

The dilation of a hydronephrosis may be confined to a single calex, or it may include all the calices. It may be that there is only a slight blunting of the calices, seen in the beginning stages, or it may be the terminal stage when the pelvis proper has swallowed up all of the calices. With the double-exposure film the amount of movement of the kidney during respiration is well shown; also the movement with change of posture.

The ureterogram should show dilatation, if present, and kinks or strictures when present. The normal ureter will show peristaltic waves. These latter must not be mistaken for strictures. Here again the two exposures will assist in making the diagnosis. Certainly, a diagnosis of ureteral stricture should not be made from a single film.

Ofttimes the presence of diverticulum of the bladder can be determined only from the cystogram of the filled bladder.

TECHNIC

In private practice I find that most of the patients sent in for urinary tract examination with the roentgen ray are sent with no preparation whatever. When suspicious shadows are found in these cases a recommendation that they see a urologist for cystoscopy is sent, with the report of the findings, to the referring physician. In my own work I do not use compression other than that which I get by having the patient draw in the abdominal wall as much as possible. Double screens at a distance of twenty-one inches from the target are used with high milliamperage and an exposure of one-tenth to one-fifth of a second.

Exposures of the injected kidney are made while the urologist continues to fill the pelvis, for we have found that if the injection is made at about the right rate the return flow is able to care for the overflow, and the peristaltic waves are then seen in the ureters; also the cavity of the kidney is more sure of being full. In our work a 25 per cent solution of sodium bromide is used for the opaque medium. Most always we fill both kidneys for comparison. When the patient complains too much of the discomfort the injection is often stopped, even before the exposure is made. In these cases very often the outlines of the pelvis and calices are not as clear as they should be. I have also noted that the nearer the kidney is to the normal, the more the patient is apt to complain of pain. Some urologists prefer to inject the kidney under the direct observation of the fluoroscope, and then the injection is continued till the solution is seen to flow down the ureter.

Before the kidney is injected a syringe should be attached to the catheter and an attempt made to empty the kidney of any residual urine. This is especially the case where a hydronephrosis is suspected. In many cases where this is not done the pyelogram is not clear because of the dilution of the opaque solution by the retained urine.

CONGENITAL UNILATERAL KIDNEY

The complete absence of one kidney and the accompanying ureter is rather infrequently met. The atrophic kidney with a partial ureter occurs more frequently. L. Polack (1909) collected from the literature 264 cases and analyzed them. He found

the kidney and ureter both absent in 153 of these. Braasch (1912) reports thirty-six anomalies, of which six were complete absence of one kidney. Morris reports unsymmetrical kidney or extreme atrophy of one kidney, occurring once in 2400 bodies. The left kidney is more frequent than the right. He also reports congenital atrophy to the extent of almost obliteration is rare, occurring three times in 15,904 post-mortem examinations.

Thomson Walker (1914) collected ninety-three cases of uremia or anuria, commencing within a few days after operation, and found that in ten cases there was complete absence of the second kidney, and in eight cases there was complete atrophy of the second kidney. A mortality rate of 19 per cent was due to lack of knowledge of the absence of the second kidney. Today, with the use of the cystoscope and the x-ray, such mistakes should not occur.

REPORT OF A CASE

G. L. Single. Female. Age, 22. Weight, about 90 pounds. Came to her physician for lung trouble. The family history was negative. Patient had had measles; petussis, no sequela; diphtheria in 1920. Some edema of the legs followed. Influenza in 1918, but not seriously ill. Tonsils removed in 1920. Menstruation, regular.

At this time (August, 1921) the physical examination was negative, and she was referred by Doctor C. O. Mitchell for a roentgen examination of the chest, which failed to demonstrate any abnormality.

In October, 1923, she was again seen by Mitchell, and at this time her complaint was a pain below the waist line and most severe when sitting. This pain came on suddenly. Two days later the pain was most severe when lying down, and was mostly on the left side. Physical examination showed a temperature of 98 and pulse of 90. Abdomen flat. In the left inguinal region a mass was felt, some two centimeters in diameter, which was freely movable and tender to pressure. On the right was a firm, smooth mass about five centimeters in diameter, freely movable and easily worked up under the costal margin.

In November the patient complained of pain on the right side, and a small mass could be felt. At this time she was referred to me to rule out a possible opaque urinary calculus.

The film showed a very clear outline of the right kidney, which was quite low, the lower pole being but very little above the crest of the ilium. No shadow of the left kidney could be found. A suspected absence of the left kidney was reported. No evidence of calculus was found.

In December the abdominal pain was constant on the right, over McBurney's point; not connected with the kidney, and worse when lying down.

December 15, Doctor W. W. Cross performed a cystoscopy and catheterized the right ureter. No orifice for the left ureter could be found. Under the fluoroscope, when injected with opaque solution, the right kidney was found to move very freely. It would descend till a kink was formed in the ureter, and then could be readily replaced in its normal position. No shadow of the left kidney could be found on the film at this examination.

The patient was later operated. The right kidney was suspended, and the appendix removed. At this time an intra-abdominal palpation was made to try to locate a left kidney, but none could be found. The patient made a good recovery, following the operation.

This case is reported because of its infrequent occurrence and because there have been such cases operated and the single kidney removed. It is essential that every kidney case have a thorough cystoscopic and roentgenographic examination before any operative procedure is done on the kidney.

Mattei Building.

DISCUSSION

GEORGE W. HARTMAN, M. D. (999 Sutter Street, San Francisco)—Radiologic examination of the urinary tract can hardly be considered complete without a catheterization of the ureters with opaque catheters. This not only serves to eliminate shadow-casting bodies exterior to the tract, but also indicates bizarre positions of ureters and kidneys.

Thomson Walker has recently called attention to calcified lymph glands causing hematuria by pressure on the ureters. An opaque catheter would be of assistance in eliminating such an error.

Many physicians are opposed to bilateral pyelograms. With extreme care in injecting, we have not had any unfavorable reactions while doing this. There is a decided advantage in being able to investigate and compare both sides at one sitting.

A problem which remains to be solved is the more successful handling by x-ray of permeable stones which do not show on the plate. We have observed a number of these recently, negative radiologically, in which the stones were passed after cystoscopic manipulation.

H. E. RUGGLES, M.D. (Butler Building, San Francisco)—As Sheldon has pointed out, careful, painstaking work and complete co-operation between the urologist and radiologist are absolutely essential in the field of genito-urinary diagnosis. By working together—preferably in a hospital—good team work is developed, time is saved, patient's discomfort lessened, and the possibility of error in diagnosis reduced to a minimum.

The radiographic examination is the only method of demonstrating anomalies of kidneys and ureters with certainty. Double pelves may be suspected cystoscopically if multiple ureteral orifices are seen, but frequently the ureters unite in the lower portion of their course and the real situation only becomes apparent in the films.

Stones which may be invisible on plain films of the kidney region (comprising 15 to 20 per cent of all stones) are at times revealed by pyelography. They may appear as "holes" in the opaque shadow of the pelvis, or by absorption of the bromide solution become visible after the pelvis is emptied.

EDWARD N. MCKEE, M. D. (Methodist Hospital, Los Angeles)—One of the important things mentioned by the author, and on which we place great importance, is the preliminary preparation of the patient. About 90 per cent of the patients present themselves without any preliminary preparation whatever. This causes an increase in expense to the patient, as well as loss of time, because the necessary preparation consumes two or three days. Our method is to have the patient take a half ounce of powdered licorice compound on the evening of the second day before coming to the laboratory for examination. Besides the powdered licorice compound, the patient takes repeated S. S. enemas the following evening, and a plain enema on the morning that he reports. The regular diet is continued up to the time of the examination, with the omission of breakfast on that day.

In the matter of technic, Sheldon failed to tell us whether or not he was using the Bucky diaphragm in his urological examination. I believe that the Bucky diaphragm is quite universally used in kidney examinations; and the other essential is a fine focus tube. We also use a compression canvas band with a basketball bladder. The patient is instructed to take a deep breath, exhale, and hold for the period of the exposure.

The technic that we employ is, spark gap, 4½ inches; milliamperage, 20; distance approximately 22 inches; and time, 6 to 9 seconds, according to the size of the patient.

By co-operation the radiologist and urologist are able to make pictures of the ureter from the kidney pelvis to its outlet into the bladder. The radiologist gets everything ready for the picture after completion of the pyelography. The urologist injects the ureter gently with a 20 cc. glass syringe, as he withdraws the catheter. The moment the tip of the catheter enters the bladder he notifies the roentgenologist, and the picture is taken.

The result will be a true picture of any intra-ureteral tumors, strictures, or kinks, and an illustration of the exact topography of the ureter. The procedure is of value in ruling out many of the various pelvic conditions.

Kidney or ureteral pathology otherwise invisible is dis-

closed by the distention it produces in the pelvis or ureter by appearing as a light or negative area in the injected fluid.

CHARLES M. RICHARDS, M. D. (Garden City Bank Building, San Jose, Calif.)—The importance placed upon preliminary preparation, by the author and others discussing the paper, is not overdrawn. Technically, excellent films can only be obtained when the alimentary tract is well emptied of both solid and gaseous contents.

Patients referred to me from out of town frequently come with little or no preparation, and I often try to save them a prolonged stay or a return trip by doing the work immediately, but more often than not the work has to be repeated because the intestinal tract, chiefly the colon, is full of gas. This condition not infrequently is caused by the conscientious effort of the referring physician to prepare his patient by the administration of saline cathartics, most commonly magnesium sulphate. The best cathartics are the vegetable cathartics, castor oil, and licorice powder.

Then, too, an otherwise good preparation has often been spoiled by unskilfully given enemas, whereby large amounts of air have been pumped into the colon; so that frequently we have purposely omitted the enemas, kept the patient on liquid diet for twenty-four hours, and given the vegetable cathartic, thus producing a quite satisfactory preparation.

The report of the congenital absence of one kidney is very interesting, and only serves to remind us that no useful step of preliminary examination can be omitted with safety when nephrectomy is contemplated.

Sheldon's technic of high milliamperage and short exposures is good for the purpose of eliminating respiratory motion, but naturally eliminates the use of the Bucky diaphragm, which is one of my greatest aids in producing valuable soft tissue films, and high contrasts, which may aid in reducing that percentage of undemonstrable urinary calculi.

DOCTOR SHELDON (closing)—It would seem that the use of six to nine seconds' exposure in the making of ureterograms would give an indistinct hazy outline, because of the peristaltic movement of the ureter when filled. This would be similar to taking that much time for an exposure of the stomach. I have, therefore, in my work preferred the rapid exposure technic. I do not see the advantage of long preparation of the patient, if elimination is started two days before the examination and the intestinal tract is at the same time filled by regular diet. The preparation, as given by Richards, is very good.

Hot Air Comfort—Heating methods, heat transmission, comfort, types of furnaces, and ventilation are discussed by Thomas Hubbard, Toledo, Ohio (Journal A. M. A.). He thinks that Americans are becoming progressively more sensitive to temperature and humidity. The popular demand seems to be for higher radiation capacity in the home, in hotels, and in public conveyances. (What a shock it would be to the heating trade if we accepted a 65-degree standard.) Climatic conditions and sudden variations of weather are naturally very trying, and we invite cold shock by hypersensitiveness. Unhygienic heating, combined with foolish estheticism in clothing (e. g., chiffon to furs), results in acute and chronic diseases of the upper and lower respiratory tract. Catarrhal affections, such as chronic sinusitis, even in young children, are far more prevalent than should be tolerated by an enlightened, intelligent people. Medical progress in the study of causes of such diseases is one of the outstanding features of this age, but treatment and cure are handicapped when the unhygienic habit is in itself chronic. The complexion is the color index of good blood and normal skin circulation. It is notorious that in America the natural color index is fading and the cosmetic index is correspondingly high. The skin, like the respiratory mucosa, is actually damaged by hot dry air (and likewise is the hair) and becomes more liable to chronic diseases. Our present high temperature standard so lowers natural resistance to minor and major infections that restoration to normal health is retarded. The fresh air treatment of hospital surgical cases is testimonial to the healing virtue of tonic temperature and natural humidity in convalescence.

AFFECTIVITY—ITS IMPORTANCE IN PRACTICAL MEDICINE

By CHARLES LEWIS ALLEN, M. D., *Los Angeles*

Affectivity varies enormously in different individuals. Its roots descend to the lowest strata, it dates back to the earliest beginnings of mental life.

Biologically, it stands in close relationship to instincts and temperament.

That differences in affectivity in different individuals depend upon a difference in their make-up, seems pretty certain.

The affective state exerts a profound influence upon the attitude, the expression and the speech, as well as upon the cardio-vascular and glandular systems, and the body nutrition.

Affectivity varies enormously from person to person, and even in the same person at different periods of his life.

Anxiety is more frequently and clearly accompanied by physical symptoms than any other affective state.

Morbid irritability, excessive lability of mood and inability to control the instincts and affective reactions is a characteristic of psychoneurotics in general.

When phantasy is allowed full play, thinking is not concerned with actualities, but follows the direction indicated by instincts and affects.

DISCUSSION *by Edward A. Franklin, Los Angeles; Aaron J. Rosanoff, Los Angeles; Josephine A. Jackson, Pasadena; Joseph Catton, San Francisco; Clifford W. Mack, Livermore.*

IN THE consideration of any disease, as to its nature, its course, and its probable outcome, as well as in its management, *the wise physician will study the patient as a whole.* By no means the least important factor is his mental make-up, particularly on its emotional side. The English word "emotion" is approximately equivalent to the German "affekt," which Ebbinghaus defines as: "Feelings which depend upon the mediation of associatively awakened conceptions, and at once appear in comparatively great intensity, are called affekts." According to Bleuler, every psychic process is divisible into an intellectual and an affective side. Under "affectivity" he considers collectively affects, emotions and feelings of pleasure or displeasure, regarding the term "feeling," sometimes applied to this group, as misleading, since it is used to mean both ordinary bodily sensations and complicated cognition processes, whose elements are by no means clear to us. Affectivity varies enormously in different individuals. Its roots descend to the lowest strata, it dates back to the earliest beginnings of mental life. "It contains everything in the way of feeling tone which the mental processes acquire at the same time that they are passing from simple sense impressions and image formation through abstract conceptions and reflexion to decision and to motor impulse" (Kretschmer). Biologically, it stands in close relationship to instincts and temperament.

The instincts of self-preservation and self-perpetuation through securing food, through the avoidance of danger, and through the sexual impulse, seem to be attributes of life itself, and are present in the lowest forms. Though their manifestations in man have become in the highest complex, they still constitute the impelling force of all his actions. With them are intimately bound up the feelings in the broad sense. In primitive man the instincts were intense and uncontrolled, while the fear of dangers both known and unknown was ever present, and