

gradually lost strength and weight, and died, apparently of exhaustion, October 4, five months after the onset of his symptoms. He was not seen by a physician the last two months of his life, and a report was obtained from his wife after his death. Necropsy was not permitted.

The clinical diagnosis was multiple myeloma.

Six other cases are recorded in the Department of Pathology of the University of Minnesota, following biopsy or necropsy, and have been made available through the courtesy of Dr. E. T. Bell of that department. They are here summarized:

CASE 2.—A man, aged 46, who had been having pain in the back for three months, presented a mass at the end of the sacrum, palpable by rectal examination. The patient died of lobar pneumonia, and at necropsy a myeloma was found, involving the ilia, the sacrum, the vertebrae and one rib.

CASE 3.—A woman, aged 62, had noticed a mass in the right side thought to be a tuberculous kidney, and had had pain in the right axilla for nine months. There was a small amount of albumin and some leukocytes in the urine. Death occurred from pyelonephritis. Myelomas were found on two ribs, but on no other bones.

CASE 4.—A woman, aged 65, who had complained of weakness and pain in the chest, back and hips for eleven months, had sustained a fracture of the wrist and ribs eight years previously and again of a rib six years previously. There was a marked hypersensitiveness of the sternum and of the long bones of the body. Several ribs showed fusiform swellings. Cystlike degeneration of all the bones was shown in roentgenograms. The temperature ranged from 99 to 101 F. Blood examination revealed: 59 per cent. hemoglobin; 3,100,000 red blood cells; 14,200 white blood cells, with 69 per cent. lymphocytes and 25 per cent. polymorphonuclears. The urine showed a faint trace of albumin, but no Bence-Jones protein, on three tests. The patient died of lobar pneumonia. At necropsy, the ribs were fragile and showed many fractures. There was very little calcium in the bones and there was red marrow in the femur.

CASE 5.—A woman, aged 57, had had spontaneous fractures of the legs and forearms for several years and had been on antisyphilitic treatment. Six months previously, she had become incapacitated by severe pain in the left hip, which continued. At times, a trace of albumin was found in the urine. Death was due to lobar pneumonia and necropsy revealed tumors in the ribs, great trochanter, innominate bone and one thoracic vertebra.

CASE 6.—A man, aged 63, who had recovered from a double empyema four and one-half years previously, had pain in the lower back, developing six months previously. Rarefaction of the bodies of the lumbar vertebra was revealed by roentgen-ray examination. Abscesses of the thorax infiltrating the muscles developed before death, which was due to a purulent bronchitis and bronchopneumonia. Necropsy revealed myeloma of the lumbar vertebrae.

CASE 7.—A man, aged 52, who was admitted to the hospital complaining of pain in the region of the dorsal vertebrae, developing first as recurrent attacks of backache, beginning about one year previously, had, for the past five months, suffered pain daily which for three weeks had been associated with numbness of the legs and a staggering gait. The roentgen ray revealed destruction of the body of the sixth dorsal vertebra, probably pressure atrophy due to a cord tumor. The urinalysis was negative. The blood Wassermann reaction was positive; the spinal fluid showed a doubtful positive and a negative Wassermann reaction on two tests. The cell count was 7 and 150, and the Nonne-Apelt reaction was positive both times. Arspenamin was given, with some improvement in sensation. A laminectomy was performed, revealing a myeloma of the sixth dorsal vertebra. The patient died shortly after this. There was no necropsy.

COMMENT

Multiple myeloma should be suspected in cases of backache or pains in the bones of obscure origin. All the tests available for the Bence-Jones body should be

tried repeatedly. The absence of this protein in no way speaks against myeloma as a diagnosis.

It is of interest to note that in this small group of seven there are four men and three women; the average age at onset was 55; the duration of symptoms from onset to death varied from three months to twelve months, with an average of seven and one-half months; Bence-Jones proteinuria was found in only one of the seven and that, after many tests, had been negative. In several of these patients the diagnosis had not been made until necropsy was performed.

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RADIUM IN TREATMENT OF NEW GROWTHS OF THE MALE BLADDER

A CONVENIENT AND EFFECTIVE METHOD UTILIZING
AN OPEN AIR CYSTOSCOPE *

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For many years in this clinic, the open air cystoscopic technic has been in daily use. It is convenient and rapid, affords direct information as to the bladder surface, and allows of the widest range of manipulative procedures within the entire bladder. As early as 1893, Dr. Kelly had made a speculum 18 cm. long and 8 mm. in diameter, similar to the now well known Kelly female cystoscope, for investigation within the male bladder; but he was unable to secure an opportunity for a practical demonstration until Nov. 20, 1897. Two patients were provided through the courtesy of Dr. H. H. Young; one was a sexual neurasthenic, awkward to control, no cocaine being used, but the principle was demonstrated and the bladder inspected, with the patient in the knee-breast posture. Another demonstration was made at the Mercy Hospital the same year, while a further demonstration was made before an audience of surgeons and urologists in St. Luke's Hospital, New York, the following year.¹ This method, however, was not employed by urologists for the male, and we ourselves had for years used only one or the other of the various modifications of the lens system water cystoscopes. Luys² of Paris constructed and extensively used an admirable instrument with a curved beak for direct vision with an electric light at the end of the cystoscope, giving perfect illumination with the patient in the dorsal posture, with the plane of the table at an angle of 45 degrees. The recognized utility of this method abroad is largely due to Luys' practical demonstrations. Dr. Geza Greenburg of New York has more recently devised a cystoscope which can be effectively used for intavesical radium application.

Dr. Kelly himself has always used the knee-chest posture as the one giving the best dilatation of the bladder and most convenient to him through long practice. While painless and best in females, this posture is not convenient in males; on the other hand, an exaggerated Trendelenburg posture with the head of the table lowered to an angle of 60 degrees gives an effectual air dilatation in all but contracted irritated bladders, and very fat subjects; in the latter groups,

* From the Howard A. Kelly Hospital.

1. Kelly, H. A.: *Ann. Surg.* **27**: 71 (Jan.) 1898; *ibid.* **29**: 475, 1898; *Bull. Johns Hopkins Hosp.* **9**: 62, 1898.

2. Luys, Georges: *Endoscopie de l'urètre et de la vessie*, Paris, 1905.

a general anesthetic will usually secure the desired result (Fig. 1).

I myself work with two instruments: the Greenberg³ cysto-urethroscope and a Kelly cystoscope 16 cm. long and 10 mm. in outside diameter. This size Kelly cystoscope is easy to introduce in the average man. It is convenient to have a series beginning with a diameter of 7.5 mm. The instrument can be introduced with a straight obturator, but an excellent modification of Dr. Curtis F. Burnam twelve years ago allows

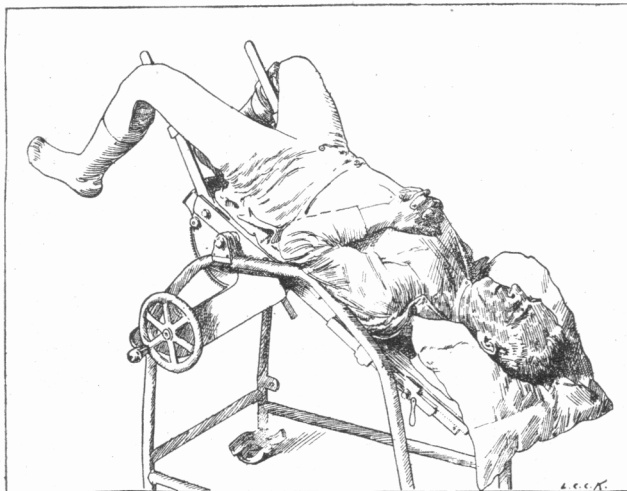


Fig. 1.—Position of patient on a Young cystoscopic table with the head lowered to an angle of 60 degrees; patient purposely not draped in order to show accurately the position.

the use of an obturator curved to take the prostatic urethra, and then straightened out and withdrawn when the cystoscope is once in the bladder. The illumination in the Greenberg instrument is by a small electric bulb in the vesical end of the instrument. The lighting in the Kelly cystoscope is by reflected light from a head mirror, exactly as in his method in women.⁴ Though this has some slight inconveniences, it gives a good light, removes all possibilities of electrical breakdowns, and is as satisfactory in bleeding bladders as in normal ones. In describing the direct aeroscopic method, I would emphasize its value in this particular connection. With the instrument in the bladder, the operator puts on the commonly used head mirror and prepares for the inspection in a darkened room. An electric light is held close to the symphysis, making as small an angle as possible, so that the light can be easily caught by the head mirror, reflected into the bladder, and kept on the object. It may be necessary at this point to remove by suction residual urine lying in the base of the bladder. By an occasional automatic touch to the head mirror and a simple manipulation of the handle of the cystoscope, all parts of the interior are accessible to a direct inspection, with the exception of the retrosymphysal region. It is helpful when examining the vertex to invert the abdominal wall above the symphysis with the free hand. A beginner experiences difficulty with the reflected light, as the head mirror is adjusted at an angle, and a slight movement leaves the field in the dark. After a little practice, however, it soon becomes as easy and simple as the examination of the throat and larynx. In this way, we can see each area in the bladder as clearly as through a suprapubic opening, and can thus determine

accurately the size and position of any existing tumor or ulcer. Tissue for microscopic examination can likewise be quickly taken with suitable forceps, or fulguration or cauterization may be carried out. The ureteral orifices can also be seen and catheterized easily, and a small stone picked up and removed. Diagnostic wax bulb catheters of any desired diameter can be introduced into the ureter with a facility unknown by those who depend on a water cystoscope.

Passing to the subject in hand, the treatment of bladder tumors through a cystoscope should be limited to cases in which all parts of the growth can be clearly seen and outlined; if it is large and infiltrating, provided the general condition of the patient permits, and there is no evidence of metastases, the treatment should preferably be by suprapubic exposure. However, when an operation is contraindicated, such patients can be helped and should be treated by the cystoscopic method.

Fortunately, vesical tumors often give rise to early symptoms, and many are discovered at a stage when the cystoscope offers as simple and as effective a route as a suprapubic opening. This method is applicable in all growths confined to and around the neck of the bladder, papillomas, papillary carcinomas and infiltrating carcinomas of not over 4 cm. in diameter. Growths other than these without evident metastasis, extensive infiltration of the bladder wall, and all doubtful cases are submitted to a suprapubic section.

I have used radium emanation with two types of applicators, as shown in Figures 2 and 3. The radium emanation for surface treatment is contained within a tiny glass bulb, 3 mm. in diameter, encased in a small brass capsule measuring 1 by 0.5 cm. and 1 mm. thick, which in turn is placed in a second brass capsule, 3 by 1 cm. and of the same thickness, and screwed to the handle. The points for implantation, bare tubes or spicules, as they are called, contain the emanation in tiny glass capillary tubes, 2 mm. long and 0.5 mm. in diameter. These are placed in the end of the hollow needle on the point of the introducing instrument; and after it is implanted into the growth, the tube containing the radium is pushed out from the needle into the tissues by means of a stylet (Fig. 4).

In 1920, Dr. Robert M. Lewis (at that time an associate at this hospital), devised an excellent instrument for implanting bare emanation tubes into the naso-



Fig. 2.—Type of applicator used for intravesical surface radium treatment through the aerocystoscope.

pharynx and larynx, as well as for use in the female bladder through the Kelly aeroscope; the instrument I use is my modification of his original one. Care must be taken to insure an accurate estimate of the amount of emanation in each tube used, and it is imperative that each individual tube should be an active one before implantation.

For surface treatment, 100 milligram hours' radiation is the maximum dosage for each square centimeter of the area of disease. In using an applicator containing 1,000 millicuries, it is therefore necessary only to hold the applicator six minutes on each area to obtain the equivalent amount of radiation. In this way, a tumor with a surface of 9 sq. cm. would receive the maximum dosage in a total of fifty-four minutes. By using a stronger applicator, the actual time of exposure can be

3. Greenberg, G.: *Ann. Surg.* **70**: 212 (Aug.) 1919.
4. Kelly, H. A.: *Am. J. Obst.* **39**, No. 1, 1894.

further reduced. The entire treatment is finished in one or two exposures, extending over a period of from two to three days. This amount of surface irradiation should not be repeated within six weeks.

For implantation treatment, the small glass emanation points are implanted directly into the growth. We employ 0.5 millicurie of radium emanation to destroy 1 c.c. of tumor. In this way, with a number of introducing instruments prepared beforehand, we can quickly and accurately introduce from ten to fifteen of

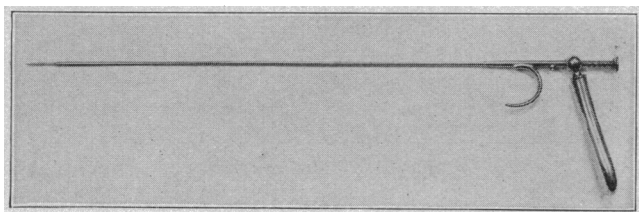


Fig. 3.—Instrument used for intravesical radium implantation treatment of bladder tumors through the aerocystoscope.

the points throughout all parts of the growth, the entire time consumed being about five minutes. The points are left permanently embedded in the tissue to decay, giving off their maximum activity by the end of seven days, but continuing slightly active for twenty-eight days; the action is local and caustic. An intensive treatment such as this should not be repeated until a period of two months has elapsed. We have found that a better result can be expected by using multiple

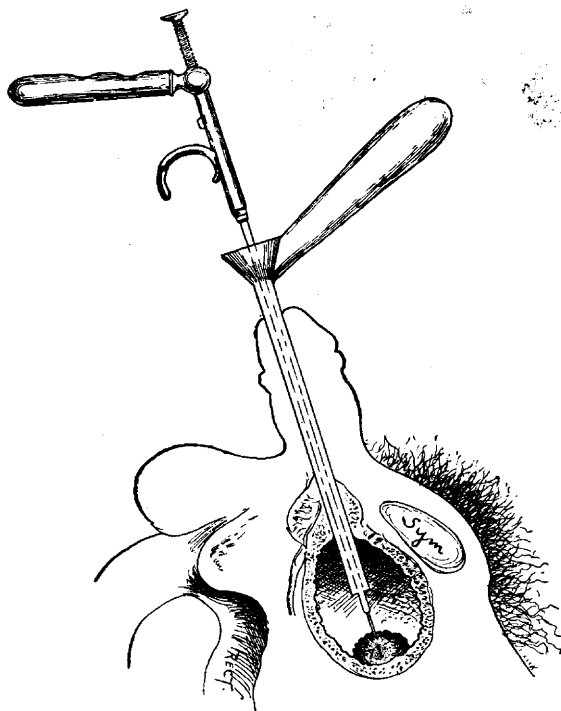


Fig. 4.—Actual implantation of emanation points into the tumor through the aerocystoscope; A, emanation point implanted into the growth.

points containing a fraction of a millicurie, rather than by implanting fewer stronger points. A number of these points escape with bits of the tumor and are discharged with the urine.

Geraghty⁵ has described the implantation treatment, which I introduced at the Johns Hopkins Hospital. Through the courtesy of Dr. Young and Dr. Geraghty,

I had the pleasure of demonstrating this method repeatedly. Not infrequently, a considerable amount of tenesmus is caused by this type of treatment, which is not experienced when the surface technic is used alone; it persists about two weeks, and is rarely severe. We note a perfect healing of the surface after a lapse of two months, and no complications have arisen from the remaining points.

CUTANEOUS ALLERGY IN SYPHILIS

WITH SPECIAL REFERENCE TO THE LUETIN REACTION AND THE NECESSITY FOR CONTROLS IN INTRACUTANEOUS TESTS *

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Statements to the effect that cutaneous allergy to *Spirochaeta pallida* and its products develops during the course of syphilis are based on the reactions observed following the intracutaneous injection of "syphilin" (extract of fetal syphilitic liver), "pallidin" (extract of fetal syphilitic lung) and more especially of "luetin," a sterilized and ground up ascites agar culture of *Spirochaeta pallida*, as prepared by Noguchi. An extensive literature has accumulated on the use of the luetin reaction as a means of diagnosis for syphilis, but not a few investigators have reported nonspecific or doubtful reactions, with the comment that control fluids of the culture medium alone yielded reactions of the same or almost the same kind and degree.

The most thorough investigation bearing on the nonspecific phase of the luetin reaction is that of Stokes.¹ This investigator has observed that the intracutaneous injection of 0.5 per cent. solution of sterile agar and emulsions of normal skin elicit reactions in syphilis quite similar to those produced by luetin. Stokes has explained these reactions on the basis that agar and other substances are capable of adsorbing antiferments and thereby liberate or render active proteolytic ferments capable of producing toxic or irritating substances by processes of proteolysis and autolysis of the individual's serum and cells responsible for the inflammatory reactions of papulation and pustulation. Stokes has very clearly described this mechanism in the following words: "While the luetin reaction seems several steps removed from the plainer case of the agar reaction, a close examination of experimental evidence bearing on it gives ground for placing it, in large part at least, in the class of antiferment-adsorbent or anaphylatoxin reactions, and treating it as in the case of the reaction to agar, not as specific for syphilis, but as a measure, albeit perhaps a sensitive one, of the ferment-antiferment balance, and of the amount or intensity of action of nonspecific proteases in the body of the syphilitic."

Stokes believes that with luetin the processes are of a dual nature, that is, that antiferment is adsorbed not only by the ascites agar, but likewise by the fragments

* From the Dermatological Research Institute.

1. Stokes, J. H.: An Intradermal Reaction to Agar and an Interpretation of Intradermal Reactions, *J. Infect. Dis.* 18: 402, 415 (April) 1916.

5. Geraghty, J. T.: *J. Urol.* 7: 33 (Jan.) 1922.