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Stricture by Electricity.

*An Investigation.*

BY  
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THE CURABILITY OF URETHRAL STRICTURE  
BY ELECTRICITY.

AN INVESTIGATION.\*

BY E. L. KEYES, M.D.

A WIDE-SPREAD belief exists in the community, lay as well as medical, that material progress has been made of late years in the use of electricity as applied to the cure of urethral stricture. This belief includes the three presumptions: (1) That any one, by following rules, may use the method successfully; (2) that electricity does no harm to the urethra; (3) that stricture cured by electricity is dissipated by absorption, and the urethra remains permanently open.

In the autumn of 1887 a gentleman with stricture came to me from South America for treatment by electricity. His surgeons at home had failed to cure him by dilatation; he declined cutting there, and came to New York, where, he had learned at home, strictures are permanently cured by electricity. Not having commenced my experiments at that date, and not wishing to trifle with a private patient, I declined to accept his case, and he sought other advice.

Shortly afterward a physician of New York in excellent standing wrote that he had a relative whom he wished to

\* Read before the American Association of Genito-urinary Surgeons at its second annual meeting.



place in my hands for urethral treatment by means of electrolysis. I also declined to receive this case. Subsequently another gentleman, under my care for a neurotic condition of the urethra, left me with my consent, and was treated by his family physician electrolytically for an alleged stricture, which the physician promised to cure, assuring him that it was the cause of all his trouble. Not getting well under this physician's care, he consulted Dr. Robert Newman as an authority upon urethral electrolysis, who assured him he had no stricture, but still proposed to remove his urethral symptoms by electricity. The patient returned to me unrelieved, declining further trial of electricity.

In these and many other ways it has come to my knowledge that confidence in the value of electricity for the treatment of stricture has of late been rapidly growing throughout the land; therefore I determined to investigate the matter, and I turned to Dr. Robert Newman, of New York city, who is the apostle of this creed, and who alleges that he has radically cured two hundred cases (or thereabouts) of stricture by its use, and asked him for instruction and his co-operation in my investigation of the subject, which I assured him was honest, stating that, if my results justified his assertions, I would advocate the method, and advise its use generally for the benefit of strictured mankind.

Dr. Newman kindly accepted the proposition, sent me his pamphlets, assured me that following his rules would convince me of their truth, and accepted from me a dispensary patient to treat that I might personally verify the result attained by himself. I therefore procured from various dispensaries seven pronounced typical cases of urethral stricture; three of these I treated personally, with all the ability I possessed, commencing in January, 1888, following Dr. Newman's rules as closely as I was able.

Three patients I turned over to my assistant, Dr. E. Fuller, who treated them independently, fortified with extra knowledge gained by personal observation of Dr. Newman's operative method as practiced by himself (one case of urethral spasm was also treated by Dr. Fuller). The seventh case was sent to Dr. Newman, who received the patient kindly, and treated him about once a week from February 6th until June 27th—nearly five months. My assistant, Dr. Fuller (once Dr. Garrison), always accompanied this patient on his visits to Dr. Newman, and immediately upon leaving him wrote down in a case-book what had happened during the interview.

One other case previously treated came to me, and out of this material I propose to construct my report.

Having entered the investigation without bias and in the hope of learning something, I make my report without fear of being misjudged, and from no motive except that of attempting to throw light upon a subject which is usually shrouded in much mystery.

To prepare properly for my work, I purchased the insulated urethral conductors of Newman, employed an admirably constant battery of A. Gaiffe (Paris), one having a milliampèremeter in the circuit, so that the amount of current used was constantly recorded under the eye of the operator. Dr. Fuller used the same battery upon his patients. In order to assure myself that the milliampèremeter in the circuit of the Gaiffe battery was accurate, I procured a Barrett milliampèremeter, so as to test the foreign gauge with one of the best of native make; they were both joined on the same circuit, and accorded absolutely for all the lower measures of quantity, and for any combination of sets of cells in the battery. There was a moderate variation in the marking of the instruments between the points of 25 and 50 milliampères; but, as all my experiments were con-

ducted at 5 milliampères and below, I must conclude that the battery was a proper one and its action satisfactory, more especially as the cells were small, ten being required to give five milliampères, so that gradations of smaller quantities of electricity became easy.

Before detailing my cases I wish to remark that Dr. Newman is largely responsible in this country for the modern electrolytic fervor as relating to urethral matters, since his statements of results have been the most pretentious. I will therefore call attention to some of Dr. Newman's rules and assertions, that it may be seen how nearly my results correspond to his statements.

Other literature upon the subject I shall mainly disregard, to escape needless repetition. The whole subject, from a literary standpoint, has very recently been discussed in an admirable manner by Dr. F. Tilden Brown, of New York.\* To those interested in this branch of the subject I commend a perusal of Dr. Brown's paper. He has digested the literary material and found it wanting in that concordance of fundamental sentiment (as to operative method, appropriate cases, and result) which might be expected from the advocates of a new system, if that system had a solid basis upon which to repose.

Indeed, I feel I can do no better, to sum up his conclusions, than to quote from his paper where he says: "I feel an apology is due for presenting before this section of the Academy a paper upon a theme with the status of which it has long been so well satisfied. If, before testing it in practice, I had reviewed the literature of the subject as care-

\* "An Essay read before the Surgical Section of the New York Academy of Medicine upon the Limitations of Electrolysis as a Therapeutic Agent in Organic and Spasmodic Stricture of the Urethra, with Cases," "Journal of Cutaneous and Genito-urinary Diseases," July, 1888.

fully as since, I should have seen that no further evidence was needed to assure the incredulous of its narrow scope, and equally well have recognized the futility of hoping to convince its advocates of any self-deception in the matter."

Dr. Brown gives his own personal results and condemns the method in so far as the alleged effect of permanently removing organic stricture is concerned, while he allows to electricity a certain effectiveness in removing spasm, an effect which Newman, in a letter to me, denies that it possesses in any degree.

In December, 1871, I published the result of my attempt to cure ten patients of urethral stricture by electrolysis applied according to the only method then existing—that of Mallez and Tripier. The merits of this method had been set forth most glowingly and with the same insistence and assurance of success that we now find made use of by Dr. Newman and those who employ his method.

My ten cases turned out badly. Most of the patients bolted the hospital, being unwilling to endure the treatment, which was very painful; none were long under observation; several remained in hospital,\* but absolutely refused to continue the electricity, preferring "cutting" or other methods.

The most pungent criticism I can make upon this my first effort to cure urethral stricture by the use of electricity is to relate the following incident:

On a certain day, less than a year after terminating my experiments at the Charity Hospital, I accidentally encountered a man, evidently in great distress, near Bellevue Hospital, toward which institution his course was directed. He was leaning against a post in the street, making serious ef-

\* "Practical Electro-therapeutics . . . Electrolytic Treatment of Stricture," etc., "N. Y. Medical Journal," December, 1871, p. 569.

forts in the vain endeavor to pass his urine. I was moved by natural sympathy, and, approaching him, pleasantly asked him what his trouble was, and whether I could be of assistance to him. He looked up and replied: "Don't you know me, Dr. Keyes?" "No," I said; "who are you?" "I am one of the men," he replied, "whom you cured of stricture at Charity Hospital, and I can not pass my water."

The Mallez and Tripier method of using strong currents and cauterizing the stricture with the negative pole, so that a circular slough comes away, is no longer used and is justly condemned. I indeed have been criticised for employing it; and Dr. Newman has plainly stated that I misjudged the value of electricity in the urethra, because I employed electro-cautery and not electrolysis—a strong current instead of a weak one. I have accepted the criticism, being only justified by the assertions of Mallez and Tripier, which I was testing.

My present personal investigation covers the modern method—namely, that advocated by Dr. Newman, who alleges such phenomenal success by it in the permanent cure of organic stricture.

As to just where electro-cautery ceases and electrolysis begins in the urethra of man when the electrical current is used, I can not say. Ström,\* of Christiania, found by experiment that stricture (after three or four weeks) could be produced in the urethra of the rabbit by the use of from two to eight elements, and sittings of from five to ten minutes. The amount of current in milliampères is, unfortunately, not given.

Dr. Robert Newman may be cited as to four of his published articles—two being sets of one hundred successful cases each, one a defense of the merits of the method, and one rules for its safe and efficient performance.

\* "Internat. Ctrbl.," 1887.

In August, 1885,\* the first table of one hundred cases of permanent cure appeared. It is maintained that all became and remained permanently well, the cure being proved by examination in attestation of the fact at varying periods—the shortest, three and a half years after the alleged cure, the longest, eleven years—without intervening treatment and without relapse.

The duration of the malady before treatment is stated to have varied from one to twenty-five years. The stricture was single or multiple, situated at points varying from close to the meatus up to nine inches. The average number of sittings required to effect a cure was about *five or six*, and *two or three months* about the average time.

In no instance was the urethra brought up to a size larger than 28 (F.); most of the patients were discharged cured taking about 22 (F.).

Newman's† second tabulated one hundred cases of radical cures were published in September, 1887. The term "cured" is omitted in this list; many patients are reported as not heard from in verification of their having retained the dilatation reached during treatment; others were still under treatment; some are reported "well" at intervals varying up to five years. The strictures had existed before treatment from one month to thirty years. The average number of sittings was *five or six*, the time required for treatment about *two to three months*.

Traumatic strictures and the result of recontraction after previous internal urethrotomy appear among the cases treated, and the patients are reported as being well for the time specified without relapse. I quote a few of the statements made :

\* "New England Medical Monthly."

† "Journal of the American Medical Association."

“Electrolysis is applicable to all strictures in any part of the urethra.”

“Electrolysis will pass and enlarge any stricture when other instruments or the skill of surgeons fail, which I have often demonstrated.”

“It relieves at once—no relapse takes place.”

In his defense of the method, Newman\* alleges as causes of failure—

1. Incompetence of the operator.
2. Mismanagement.
3. A mistaken diagnosis.

He cites cases, accuses those who have used a strong instead of a weak current, advocates a special electrode, great gentleness, weak currents, long intervals between the sittings, etc., and concludes by stating that “electrolysis can not fail, but operators may and do.”

Finally, in his article giving the method in detail,† and referring to a long list of contributions from others upon the general subject, he gives twenty rules for the management of cases, which I need not repeat here, including specifications as to the battery, the galvanometer, the employment only of the negative pole, the use of his egg-shaped bulb electrode, and how to turn the current on and off. In another paper (“*Jour. of the Am. Med. Assoc.*,” Sept. 24, p. 390) he says, speaking of his last one hundred cases: “Each séance lasted from two to ten minutes. I do not like to prolong it more, except for good reasons.”

He advocates the avoidance of pain, advises that the patient be in the erect position, condemns the use of two electrodes in succession at one sitting, denounces the use of force or the employment of the treatment when the urethra

\* “Is Electrolysis a Failure?” “*Med. Record*,” Sept. 25, 1886.

† “The Armamentarium for the Treatment of Urethral Stricture by Electrolysis,” “*Med. Register*,” Philadelphia, 1887.

is even subacutely inflamed, objects to anæsthetics, and states again: "All strictures are amenable to the treatment by electrolysis." He adds that the patients may keep about, that the method relieves at once and is devoid of pain, danger, or inconveniencé, and not followed by hæmorrhage, fever, or other unpleasant consequences, and that no relapse takes place.

I wish to state here that all my relations with Dr. Newman have been most amicable; he has been particularly courteous in supplying me with his pamphlets, and instructing my assistant, Dr. Fuller, in furthering my study of the subject; and that I, on my part, entered into the investigation in the hope of demonstrating that the method did possess value, and to decide how much.

In the following cases I have observed the rules laid down as nearly as possible, always using the negative pole of Newman's electrode, lubricated with glycerin, and employing mild currents; deviating from the rules somewhat occasionally, but not so much, it will be observed upon close reading, as Dr. Newman himself deviated in the case he kindly consented to treat for me in the presence of my assistant, Dr. Fuller.

It is necessary in a question of this kind to be rather full in the history of the cases; therefore I give them more at length than might otherwise seem necessary. The case of J. D. (VIII), treated by Dr. Newman for me, is condensed from the note-book, the notes being written up by Dr. Fuller immediately after each sitting.

Other physicians have tested the treatment in a few cases and furnished me with their unpublished conclusions. I can not, however, reproduce them here, nor any of them, unless I brought in all; my excuse is that this investigation is a personal and not a statistical one, and I must of necessity confine my conclusions to the results of cases

which have passed under my own eye and those subject to my personal direction.

CASE I—*January 27, 1888.*—A. M., aged seventy-four, a man in the possession, apparently, of full and vigorous health in spite of his years, passes acid urine, somewhat turbid with pus, every two hours in a small stream, with straining. Thirty-five years ago Dr. Van Buren treated him for a deep urethral stricture by the use of steel sounds. Since that time no instrument has been used. At five inches I find a tight stricture admitting only a filiform whalebone. At two inches and a half slight contraction, admitting 22 F. bulb.

*30th.*—Electrode 16 (F.); five milliampères; three minutes; no effects.

*February 3d.*—Electrode 16 (F.); five milliampères; four minutes; no effects.

*7th and 14th.*—No. 16 (F.); four and five milliampères; four minutes; no effect.

Much local disturbance followed this last effort, although the deep stricture was not passed and no blood appeared at the moment of operating; pain, however, followed, with fever, blood, excess of pus, and much increased local vesical irritability, confining the patient to bed for a week.

*March 2d.*—I therefore determined that more electricity and greater length of time were not desirable, but that the stricture must be dilated in any case, and introduced into the bladder easily over a whalebone guide a metallic 9 (F.) steel tunneled sound. As a result, there was little or no local disturbance, pus diminished, the stream became larger, the intervals longer.

*9th.*—Over a whalebone guide I attempted to pass a No. 12 (F.) electrode, using no force, five milliampères for five minutes, and failed to pass the stricture; considerable pain was complained of at once. The patient wrote to me twice afterward during a month that great local disturbance followed, confining him to bed with local inflammation and much increase of pain, pus, and irritability. Then he wrote, making an appointment to come up, but failed to appear. Six months later (Sep-

tember 13th) I examined him and found his condition and his stricture practically what they had been at our first interview. Filiform enters with difficulty; No. 9 tunneled engages, but will not pass.

Surely in this case the electricity was not suitable, and, without the employment of force, produced more local disturbance than the use of ordinary dilatation with force had done at a previous sitting.

CASE II—*January 30th.*—L. F., aged thirty-one. Ten years ago, one year after gonorrhœa, Dr. E. A. Banks, at Bellevue Dispensary, passed a No. 18 (F.) steel sound, and told him he had stricture. Gleet continued, but no further instrument was introduced until two or three years ago, when, having a retention of urine, he applied at the Bellevue Dispensary, and Dr. S. Alexander passed sounds, commencing with a small instrument and rapidly working up to 27 (F.). He remained well for a year, except for a continuous gleet, when retention again came on after drinking. He applied to Dr. Creary, at Bellevue, who relieved him with a catheter. Five weeks ago, again having retention after drinking, and applying at Bellevue, he was relieved by the passage of sounds Nos. 15, 17, 18, and 20 (F.), and since that time has had no retention, but a little vesical irritability.

The meatus takes 30 (F.) at two inches and a half; a moderate annular stricture admits 23 (F.) at the bulbo-membranous junction; 19 (F.) goes easily through a soft area; a drop of blood follows withdrawal of the instrument. I use 30 (F.) bulb, five milliampères, four minutes, and fail to pass the stricture at two inches and a half.

*February 6th.*—Bulb 27 (F.), four milliampères, four minutes, and fail to pass stricture at two inches and a half; 22 (F.) bulb, four milliampères, four minutes, passes easily.

*13th.*—No. 25 (F.) bulb, used carefully as a test, will not pass. I use 22 (F.) bulb, therefore, with three milliampères, for five minutes. It passes, but with more difficulty than a week ago; this is upon the two-and-a-half-inch stricture.

*20th.*—Slight irritation followed, but the gleet is decidedly better; 22 bulb to-day will not pass. I use, therefore, 16 (F.) bulb, three milliampères, six minutes, and pass the two-and-a-half-inch stricture without pain, bringing no blood. This 16 bulb passes the deep stricture also easily without electricity.

*27th.*—No. 18 bulb passes anterior stricture. I use 16 bulb again, five milliampères, ten minutes, and enter the bladder again easily, this time with the current on.

*March 5th.*—No. 20 bulb, five milliampères, five minutes, passes two-and-a-half-inch stricture with a little effort; 17 bulb, five milliampères, half a minute, passes deep stricture.

*19th.*—No. 22 bulb, five milliampères, five minutes, passes anterior stricture; 20 bulb, five milliampères, four minutes, passes deep stricture.

*April 2d.*—No. 25 bulb, five milliampères, ten minutes, will not pass anterior stricture; 22 bulb, five milliampères, passes and also enters bladder.

*23d.*—I test stricture to-day at two inches and a half; 23 bulb will not go; 19 goes without electricity, then 21, and then with some effort 23. I then use 25 bulb, five milliampères, twenty-five minutes, holding it firmly against the anterior stricture. It will not pass, so that in this case, after more than two months' persistent treatment, the stricture is absolutely at the same size as when I commenced, 23 (F.). The deep urethral congested area, being soft and yielding to dilatation, has advanced three sizes French.

*September 13th.*—Re-examined; 18 bulb will not pass two-and-a-half-inch stricture; 15 goes, and then with force I pass the 18 bulb; 18 blunt steel sound then enters, but will not pass deep stricture.

CASE III—*February 4th.*—F. S., aged thirty-three, complains of frequent urination in a small stream, due to stricture following a gonorrhœa acquired eight years ago; not previously treated; 14 (F.) bulb detects double linear stricture at two and three inches; 12 soft bougie easily enters bladder. I use 16 (F.) bulb, five milliampères, four minutes; it will not pass.

*8th.*—No. 16 (F.) bulb, four milliampères, one minute, will not pass anterior strictures; 10 (F.) bulb, four milliampères, held

in the strictured area four minutes, brings trace of blood. I do not attempt to pass the deep urethra.

15th.—Patient reports the stream smaller, and that he is worse; this is doubtless because I did not pass the deep urethra at the last visit. I therefore now pass 12 (F.) soft bougie into the bladder, and use 12 (F.) bulb, three milliampères, ten minutes, in the anterior strictures; no blood.

23d.—Mistaking the number, I try with some force to pass 21 (F.) soft (instead of 12); it will not go, but dilates the stricture, so that 16 (F.) bulb enters anterior strictures and allows me to use four milliampères for six minutes, with a trace of blood.

28th.—Retention of urine for twenty-four hours after last sitting; 16 bulb goes with more difficulty than last time, but with it I use five milliampères for ten minutes.

March 7th.—No. 17 bulb goes with a little difficulty, bringing some blood, under the use of five milliampères for eight minutes.

16th.—No. 20 (F.) bulb, five milliampères, ten minutes, will not pass.

22d.—To-day, in despair of help from electricity, I use an ordinary conical steel sound, 21 (F.); it goes, bringing a faint trace of blood; I follow it with 20 bulb, using five milliampères for five minutes.

In this case, therefore, retention of urine was produced by the treatment, which was finally abandoned, and ordinary dilatation substituted for it.

CASE IV\*—*February 16th.*—J. H., thirty-five, complains of difficulty in urination, and having had retention three times during the past eighteen months, gonorrhœa seven and two years ago; treatment by sounds at New York and Chambers Street Hospitals; stricture at bulbo-membranous junction. Filiform whalebone enters bladder, and over it a 19 (F.) tunneled steel sound; the stricture is of the soft variety, a congested surface with underlying spasm.

\* Cases IV, V, VI, and VII treated for me by Dr. E. Fuller.

*24th.*—Relief followed the sound, and no disturbance. To-day, 12 (F.) tunneled electrode, five milliamperes, two minutes, passes the stricture; electricity continued in all six minutes.

*March 2d.*—A chill and fever followed the electrical treatment, causing the patient to lie up for three days; 17 (F.) tunneled electrode, five milliamperes, passes stricture in three minutes. The current was kept in the stricture for nine minutes longer.

*9th.*—Twenty-four hours after last sitting chill, fever, and vesical tenesmus laid the patient up for two days. Stream is now better than formerly; 20 (F.) tunneled bulb, four milliamperes, fifteen minutes, enters bladder; current continued two minutes longer.

*April 6th.*—No trouble after last sitting. Blunt 16 (F.) sound enters bladder without electricity; 20 (F.) bulb will not go; 22 (F.) bulb, five milliamperes, enters bladder in eight minutes.

*13th.*—Only trace of blood follows. Retention occurred during the week, but now stream is again satisfactory; 22 (F.) bulb, five milliamperes, ten minutes, will not pass.

*20th.*—Great complaint of pain and trouble in urinating during the entire week; worse than before the use of the electricity, which he strenuously objects to. Electricity abandoned; gradual dilatation with conical steel sounds by old method up to 26 (F.).

*27th.*—No trouble followed last sitting; steel sounds used easily up to 32 (F.).

In this case urethral fever, laying the patient up in bed, was produced by the electricity, retention of urine and great pain and distress; so that the treatment was abandoned, and ordinary dilatation substituted.

CASE V—*March 27th.*—M. C., aged thirty-two, complains of stricture following gonorrhœa, and has retention at the time of application. No instruments have been ever used, except a sound in exploration just before his visit; at two inches and a half, triple linear stricture, admitting 19 (F.) blunt steel sound, which enters the bladder.

*30th.*—The patient for a time since the exploration has had to use a 16 (F.) catheter in order to urinate. Soothing means were employed in the usual way, and a few deep urethral injections, until the catheter was discontinued and urination comfortably performed, the patient being apparently well.

*April 6th.*—No. 17 (F.) bulb, three and four milliamperes, eight minutes, passes into bladder; tingling pain complained of.

*13th.*—Retention followed electricity, and two days later perineal swelling and great local tenderness, making it difficult to walk. Brawny perineal induration remains. No electricity to-day.

*20th.*—Better, but lump in the perinæum persists, although subsiding.

In this case the electricity nearly produced perineal abscess, and was abandoned.

CASE VI—*April 2d.*—W. W., forty, complains of difficult urination in small quantities, following numerous attacks of gonorrhœa; never had retention, and no instrument has ever been passed. Meatus takes 20 (F.), which just detects a tightness at two inches and a half; 13 (F.) is arrested at the bulbomembranous junction. Filiform whalebone enters bladder easily; over it a No. 11 (F.), tunneled electrode, 4 milliamperes, enters the bladder easily, without resistance, in one minute; trace of blood; no pain.

*9th.*—Meatus forcibly dilated to 22 (F.); 22 (F.) electrode, four milliamperes, one minute and a half, enters bladder easily; trace of blood; electricity continued in all two minutes.

*17th.*—Stream smaller again, and some vesical irritability complained of. No electricity to-day.

*23d.*—Meatus dilated to 26 (F.); 26 (F.) electrode, five milliamperes, ten minutes. It was resisted for eight minutes, and then passed.

*May 6th.*—Some discharge from the urethra since the last application; 22 (F.), is the largest bulb that will pass the two-and-a-half-inch stricture.

No attempt was made to test the size of the deeper stricture, and no electricity used. The patient now ceased to attend,

and could not be found for a time, but he continued taking an alkaline medicine, which comforted him.

*28th.*—A blunt steel sound, 22 (F.), enters the bladder; the stream is larger than formerly, and there is less difficulty in urinating, but otherwise all symptoms remain as they were when patient applied for treatment—namely, precipitous urination of a fluid full of deep urethral shreds, pain at the head of the penis, and imperfect erection. In other words, the element spasm is better for the dilatation, and the addition of electricity to the dilatation did no harm.

Manifestly there never was any deep urethral fibrous stricture in this case, or a jump from an 11 electrode (passed in one minute with four milliamperes) to a 22 electrode, which would pass in one minute and a half with four milliamperes one week later, would have been impossible. I say "impossible" advisedly, referring to my experience in other cases with the method.

Clearly this is the kind of case that deceives the unwary and those who wish to be convinced. The type of case is not very unusual. A man has several attacks of gonorrhœa; then he begins to urinate in a smaller stream. He has no gleet, but his urine is full of angular, thickish clumps of pus from the deep urethra; he often has pain in the penis and imperfect erection, and his urination is liable to trouble him by the precipitant urgency of the call.

Examined with the bulb, the orifice, as usual, is a little small, and at two inches and a half is the habitual point of physiological narrowing. The steel sound hesitates at the bulbo-membranous junction; perhaps it will not enter at all, even in competent hands.

Such a case is often called one of deep urethral muscular spasm, due to anterior stricture of large caliber. It gets well by cutting the anterior strictures if—and, in my opinion, only if—the deep urethra is also dilated.

It gets well under ordinary dilatation. It remains per-

manently well in either case if, and only if, by the dilatation, by subsequent deep urethral injections, by deep urethral irrigation, or by soothing internal medicine, the catarrhal surface yielding the shreds of pus is much bettered or cured.

It often gets well without electricity, without cutting anteriorly, without dilatation of the deep urethra, under the use of deep urethral instillations of the nitrate of silver carefully applied. But dilatation always improves the facility of urination in these cases, while failing to dissipate the shreds of pus and the other symptoms, and electricity added to the dilatation manifestly does no harm, possibly good. I can not now decide this point.

Certain it is that the amount of dilatation effected by the instrument carrying the electricity afforded the patient in this instance a larger stream, and allowed him to urinate with less effort; but to assert that it cured any fibrous stricture of the deep urethra is begging the diagnosis.

*September 14th.*—Re-examined to-day, this patient's condition is satisfactory. No. 20 bulb passes with moderate effort, the stream remains good, the symptoms of deep urethral inflammation have disappeared, the spasm has not recurred. Whether the electricity helped the dilatation and the alkaline medicine in accomplishing this cure I can not say. If so, it is useful in spasm.

CASE VII—*April 10th.*—M. T., aged thirty-two, has had numerous attacks of gonorrhœa, and has noticed gradual diminution of the size of the urinary stream for the past three years, with sometimes delay for more than an hour in starting the urine. He has passed a No. 8 (F.) soft bougie upon himself from time to time during the past year. At five inches and three quarters there is a stricture admitting No. 8 (F.); over filiform, 12 (F.) electrode, tunneled, five milliamperes, enters the bladder in eleven minutes; the current was passed six minutes longer, a total of seventeen minutes.

13th.—No after-effect of a disagreeable sort from the electricity, but the same difficulty and slowness of urination continues.

20th.—Reports that he can not now use his own instrument; he has had an attack of retention, partly relieved spontaneously; he is frightened, and objects to further use of electricity. Not even a filiform instrument can be made to enter to-day. The patient desires to enter a hospital. No further treatment used, as he is allowed to go to hospital.

The case treated by Dr. Newman:

CASE VIII—*February 4, 1888.*—J. D., aged forty-four, had gonorrhœa sixteen years ago; fifteen years ago, for retention of urine, meatotomy was performed in Bellevue Hospital, with dilatation.\* No sounds were used subsequently, and in six or eight months recontraction manifested itself through frequent and difficult urination, and he was dilated up to 30 (F.). He then omitted the dilatation, and gradual recontraction occurred, but it did not seriously incommode him until two years ago, when for retention he was again dilated at the Demilt Dispensary up to 30 (F.). Ceasing the use of instruments again, recontraction asserted itself, and yesterday he again had retention, and applied at a dispensary. No. 21 (F.) conical steel sound was introduced, and the patient sent to be treated by electrolysis. At four inches and a half from the meatus there is a double linear (fibrous) stricture, which can be detected by No. 15 bulb, although 21 (F.) steel sound passed yesterday.

Dr. Newman kindly consented to cure this patient, although he objected that it was not a perfectly suitable case, since it had once been, as he then supposed, cut internally; however, he attempted its cure with confidence.

6th.—Dr. Newman used 11 bulb, three milliampères, ten minutes upon a guide, passing it several times back and forth through the stricture. He orders an injection of sulphate of zinc in water (gr. iiij— $\frac{3}{4}$  iv) to be used four times daily, and says

\* This patient stated at first that he had been cut, and it was supposed by Dr. Newman and myself that his stricture had been cut internally. When questioned finally, he affirmed that the cutting was meatotomy.

the case is not typical, since there is a little pus, and a trace of blood follows the instrument; yet he purposes to continue.

*15th.*—No. 14 (F.) bulb, tunneled, four milliampères. Some force is required to get the instrument through; then the current is used, the instrument being passed back and forth through the stricture for ten minutes.

*22d.*—No. 17 (F.) bulb, five milliampères, passes after twelve minutes' pressure. More blood than usual.

*March 7th.*—Silver tunneled conical catheter, 18 (F.), is passed without appreciable obstruction; this instrument is connected with the battery, and five milliampères employed.

*14th.*—No. 21 (F.) bulb, five milliampères, twenty minutes, will not pass; patient asserts that his stream is smaller.

*21st.*—Patient still states that his stream is no better. No. 21 (F.) bulb, five milliampères, seventeen minutes, fails to pass, the patient perspiring profusely; then the same silver tunneled catheter which had been used March 7th was threaded upon a guide connected with the battery, and, after about ten minutes' trial, the attempt to get into the bladder was abandoned, the instrument being grasped very tightly by the stricture. It was withdrawn after almost fifteen minutes, the patient feeling faint. Quinine ordered, and belladonna suppository. Dr. Newman maintains that the reason the instrument will not enter is "spasm."

*28th.*—Patient states that after the last visit he was very sore for five days, and passed considerable blood.

Dr. Newman admitted that the force used at the last visit had been a mistake, and that he had lost ground thereby. He denied that the spasm was due to the treatment, but stated that it was due, like many other queer things, to the "blizzard"—the storm which had prevailed on March 12th—stating that he had another case acting in the same way from the same cause. No. 20 (F.) bulb, five milliampères, fifteen minutes, fails to pass, and Dr. Newman admits that now the stricture is tighter than before. He advises two weeks' rest, and will begin again.

*April 11th.*—Conical metallic tunneled 18 (F.) sound passed on a guide. The milliampèremeter was not used, but the current was turned on until the patient said the instrument felt

pretty warm. Considerable force was employed, and in about two minutes the sound entered the bladder; it was allowed to remain about four minutes and then withdrawn, followed by a fair amount of blood.

17th.—Dr. Keyes tested the patient as to his condition to-day. He found that only 12 (F.) would pass easily; the stricture bleeds; the meatus takes 29 (F.).

18th.—Dr. Newman tries 21 (F.) bulb, but, failing to pass, gives it up, using no electricity.

25th.—Dr. Newman injects a solution of cocaine into the deep urethra before introducing the electrode, 21 (F.), bulb; no milliamperemeter is attached, but the current is increased until the patient complains of heat. The bulb will not pass, therefore 18 (F.) conical steel sound, tunneled, is used with the current; some blood escapes.

May 2d.—Patient states that there has been no improvement since commencing electricity.

Dr. Newman tries 21 (F.) bulb, but fails after ten minutes; he then takes a conical instrument on a guide and *dilates* up to 21 (F.), applying the current through this instrument; he now again introduces 21 (F.) bulb, which enters the bladder. Altogether electricity was applied three times in succession at this sitting; considerable blood followed.

16th.—Dr. Newman uses 23 electrode without guide, five milliamperes, ten minutes. The instrument will not pass, and patient declares that his stream is as small as ever.

23d.—No. 25 electrode, five milliamperes, ten minutes, will not enter the bladder.

25th.—Much blood followed the last operation, and is still flowing to-day. Dr. Keyes tests the stricture and finds it at four inches and a half (full) refusing to admit 14 bulb.

30th.—No. 18 metallic conical sound introduced by Dr. Newman upon a guide with five milliamperes, and deep urethra dilated; then 18 electrode, which now passes the stricture under five milliamperes, ten minutes. Considerable blood appears.

June 6th.—No. 23 electrode, with electricity, without guide, by Dr. Newman (Dr. Garrison being present), fails to pass the stricture, a failure ascribed by Dr. Newman to spasm.

*13th.*—No. 25 electrode, five milliampères, fails to pass. This time Dr. Newman ascribes the arrest to the triangular ligament. Much blood.

*17th.*—No. 27 electrode, five milliampères, six to eight minutes, will not pass. Dr. Newman states that the obstruction is spasm, that the stricture is cured, and that the spasm will probably soon get well if let alone. He prescribes belladonna and opium suppository.

*20th.*—Dr. Newman introduces filiform bougie, and over it 17 electrode, five milliampères; much force used; considerable blood and pain. The instrument finally goes through.

*24th.*—Considerable blood now after each sitting. Patient getting restless and discouraged. Dr. Newman to-day tries 22 tunneled electrode on guide, five milliampères, ten minutes, but, failing to pass, withdraws the electrode and substitutes over the guide a 17 tunneled electrode. This he passes through with considerable effort. Much blood.

*27th.*—No. 25 electrode, five milliampères, ten minutes, fails to pass.

To-day Dr. Keyes explores. No. 17 bulb encounters stricture at four inches and a half. It passes through, finds no spasm beyond, and enters the bladder. On withdrawal, it is firmly detained behind the stricture at a distance measured, after its removal, of four inches and three quarters. The double linear stricture therefore, after nearly five months' treatment by electrolysis, will take a bulb two sizes (French) larger than at the commencement; its double linear character has disappeared; it is tougher, more fibrous, thicker than ever. Dr. Newman writes Dr. Keyes that the stricture at four inches and a half is cured, but that another stricture at five inches and a quarter is not yet well. This latter is the same stricture, in all certainty, the differences in alleged depth from the meatus being due to the fact that traction is made upon the penis in one instance and not in the other.

*September 10th.*—To-day, ten weeks and a half after cessation of all treatment, Dr. Keyes examines the patient, who complains that his stream is getting very small, that he urinates frequently and with effort, and sometimes dribbles involuntarily. No. 17 bulb stops at four inches and a half. No instrument will

go until size 8 is reached. This passes, is followed by 12. Then a 12 bulb goes through by exercising force, and catches distinctly upon withdrawal. Blood follows. No large instrument will pass. The result, therefore, is a loss of at least three sizes by fibrous recontraction in less than eleven weeks.

Dr. Newman called upon Dr. Keyes early in September in response to an invitation to attend the congress and discuss this paper, and stated that he would not acknowledge the result in this case, whether good or bad, as conclusive evidence for or against the method.

The natural comment upon Dr. Newman's case (VIII) is that relief did not occur at once or at all, that cure was not effected, that blood was brought, pain caused, the electricity not always measured, and that more than one electrode was used at a single sitting. His treatment lasted nearly five months—a time, according to his published statements, ample for effecting a cure.

As for my own several test cases, I may summarize them by saying that in no instance did any more benefit appear from the electricity than could have been obtained by ordinary dilatation; that most positive failure of cure must be reported for all; that pain, local inflammation, putting the patient to bed, and threatened perineal abscess must be noted as among the complications of treatment; that relapse as to recontraction of the stricture was found in all the cases tested, after a moderate interval, being most marked, however, in the case of the patient treated by Dr. Newman for me. For his sake I regret this fact, since he was most kindly in his efforts to help my study, and I regret that his patient at least did not have a better fate.

I must add one more case observed by myself before I commenced this investigation.

CASE IX.—E. S. E., aged thirty-eight. The patient I now present for your inspection is a lamentable instance of the harm that may be done by the use of electricity in the urethra in careless hands, the current in this case having been

undoubtedly used at a strength capable of producing caustic effect.

This patient visited me in August, 1887, stating that, being strictured in the anterior urethra at about two inches and a half, a physician passed 25 (French) sound upon him. Afterward, in Brooklyn, being assured by a homœopath that he could cure him radically, he went to the latter, who, by treatment, so burned the urethra at the strictured (?) point as to inflame the canal, causing it to swell sufficiently to produce retention of urine, and left him permanently worse, with the hard lump which you will now feel as large as a small marble, nearly as hard as bone, and surrounding the urethra at about the middle of the pendulous portion.

The patient then went to Dr. Newman, who treated him with mild currents about twelve times, assuring him he could help him,\* yet producing no favorable effect, either upon the lump or upon the symptoms.

The patient concluded, therefore, that he had had electricity enough, having suffered from retention a number of times during his treatment, and getting under Dr. Newman's rather worse than better. He therefore applied to me, that other means of relief might be instituted.

When I saw him, in August, 1887, he had painful and most pronounced chordee during erection. The lump, still present in his urethra, was insensitive to pressure; the strictured area admitted with difficulty No. 11 (F.).

I cut this man more extensively than any patient I have ever performed internal urethrotomy upon—namely, on August 22, 1887, to 40 (F.) on the roof of the urethra. The penis is not very large, measuring only three inches and a third; but I endeavored to cut through the limit of the morbid tissue. In this I failed, and the subsequent use of instruments did not prevent recontraction. The sounds passed with pain and brought blood, and the stream of urine was not materially increased in size.

\* Dr. Newman informs me that he declined to continue in the treatment of this patient, knowing his not to be a suitable case, and says that he sent him to me.

Therefore, on October 2, 1887, nearly a year ago, I cut him again internally on the floor of the urethra, and, being determined to be through, I cut him to 44 (F.), cutting through the sheath of the urethra—indeed, cutting everything except the skin. Considerable subcutaneous hæmorrhage, and at one time a moderate urinary infiltration, followed; but my object was accomplished, the cicatricial ring was fairly divided, the inflammatory symptoms were easily subdued, and the patient has since grown fat and enjoys the best of health, passing a full stream at proper intervals. The hard lump remains, but is slightly smaller. The patient passes for himself easily, once a week, a No. 34 French bougie. The chordee persists, there is no gleet, and the bladder is not irritable.

To what extent, or whether ever, the cicatricial lump caused by the electricity will be absorbed, I can not say.

*In conclusion*, I may state that electrolysis with a very mild current—I prefer to put it at less than two milliamperes and a half—does no harm; in fact, does nothing that I can appreciate, and does not interfere with the benefit to be derived from ordinary dilatation. I believe that a strong current is full of danger, both immediately from irritating effect and ultimately from cicatricial effect; and that employment of the negative pole does not prevent this.

My study of the subject and the experience it has brought me, digested with all the impartiality I possess, lead me to state that the allegation that electricity, however employed, is able to remove organic urethral stricture radically, lacks the requirement of demonstration. The confidence of its advocates that it will radically cure organic fibrous stricture is, in my opinion, due either to the combined credulity of the patient and imagination of the surgeon, or to some special but fortuitous act of Providence, upon the co-operation of which, in the case of his own patients, the general practitioner can not with any confidence rely.

Case.	Name.	Age.	Number, size, and quality of strictures.	Symptoms.	Former treatment.	No. of sittings.	Sizes of electrodes.	Amount of current and time of employment.	Results during treatment.	Duration of electrical treatment.		Final result when last tested.	No. days between last application of electricity and final testing of urethra.	Result.
										Days	Days			
I.	A. M.	74	2½ inches, linear, 22 F., films, 5 ins. filiform.	Frequent urination; small stream; purulent urine. Repeated retention.	Dilatation 35 years ago.	5	16 & 12 F.	4 & 5 milliam-pères; 3 and 5 minutes.	Great irritation; failure to pass stricture.	37	228	Recontraction.	Days. 188	Failure.
II.	L. F.	31	2½ inches, 23 F., films, 5 inches, 19 soft.	Frequent urination; small stream.	Nothing.	8	10 & 20 F.	4 & 5 milliam-pères; 4 and 10 minutes.	Moderate gleet; comfort in urination as after form'r use of sounds	82	225	Recontraction, 5 sizes.	143	"
III.	F. S.	33	2 and 3 ins., double linear films. 14.	Frequent urination; small stream.	Nothing.	8	10 & 20 F.	4 & 5 milliam-pères; 4 and 10 minutes.	Retention from dilatation once.	46	46	Treatment abandoned; dilatation substituted.	Not found later.	"
IV.	J. H.	35	5 inches, 19 F., linear, soft.	Frequent urination and retention.	Sounds.	5	12 & 22 F.	4 & 5 milliam-pères; 3 and 17 minutes.	Retention once, pain often.	48	56	"	"	"
V.	M. C.	32	2½ inches, 19 F., triple linear.	Retention.	Nothing.	1	17 F.	3 & 4 milliam-pères; 8 minutes.	Threatened perineal abscess.	1	24	"	"	"
VI.	W. W.*	40	2½ inches films, 20 F., 5 inches, soft, 13 F.	Frequent urination; small stream.	Nothing.	3	11 & 26 F.	4 & 5 milliam-pères; 1 and 10 minutes.	Vesical irritability and urethral discharge.	21	200	Increase of 9 sizes F.	144	Soft, non-fibrous stricture, with spasm, overcome; cure permanent. Failure.
VII.	M. T.	32	5½ inches, 8 F., linear films.	Partial retention; small hesitating stream.	Soft bougie, No. 8 F.	1	12 F.	5 milliam-pères; 17 minutes.	Retention.	1	11	Treatment abandoned to enter hospital.	Not found later.	"
VIII	J. D.	44	4½ inches, films double linear, 21 F.	Repeated retention.	Meatotomy, subsequent courses of dilatation	20	11 & 21 F.	3 milliam-pères to an unmeasured quantity; 10 & 20 minutes.	Pain; blood; local distress; stream smaller under treatment.	142	219	Worse by 3 sizes than before tr'tment, or by 9 sizes if sound is accept'd as gauge	75	"

\* Case of spasm. Cases IV, V, VI, and VII treated by my assistant, Dr. Fuller. Case VIII treated for me by Dr. Robert Newman.



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