On

The Treatment Of Strictures of the Urethra by Incision

By

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Treatment Of Strictures of the Urethra by Incisions

In the history of the treatment of stricture of the urethra, we find that the first measure for relief which was resorted to in the practice of surgery was Dilatation, carried on by means of metal bougies. This is the treatment which is still successfully employed in the large majority of cases. The manner of using the bougie with the view of most speedily and safely dilating the stricture and the theory of its action, have been matters of controversy. It is now, however, understood to act by producing intestinal absorption in the contracted and thickened part of the canal, by the effects of mechanical pressure and stretching employed at intervals and with gradually increasing sizes of bougies till the cure is completed.

The other methods of treatment which have been resorted to, for the most part, as aids to Dilatation, are reducible to two. Escharotics & Incisions.
Eoscharotics have been employed also from very early times, but are now almost entirely abandoned in the treatment of structure of the urethra. They were much used by John Hunter and Dr. C. Bell both the Nitrate of Silver and the Caustic Potash in the solid form. The chief objections to their use are: (1) the risk of exciting a dangerous degree of inflammation in the urethra, and (2) the great length of time and number of applications often required. In a case of Lieut. E. Home's the caustic is said to have been applied upwards of 1000 times and during a period of 15 years before a catheter could be passed into the bladder. By some surgeons Nitrate of silver is still used as a means of lessening the irritability of some strictures, thus aiding dilatation. In these cases an eoscharotic effect does not seem to be required. It is used much on the same principle as in Chronic Inflammation of the urethra or gonorrhoea, a frequent precipitating cause of stricture.

Incisions of various kinds have been practised in the treatment of structural urethra, but their object and the means of performing them
have been so different at different times that it is necessary to distinguish between them in order to estimate what their success has been. It is this part of the subject I wish to take up, not for the purpose of stating any new views, but to examine the opinions which have been already brought forward and to relate one or two cases I have seen successfully treated in this way.

The first notices of Incisions in the treatment of structure of the urethra occur in the works of Ambrose Paré and De Bega in the beginning of the sixteenth century and of Vesalius at the close of the seventeenth century. They were incisions made within the urethra and were recommended for the purpose of rubbing down by attrition the polyoid growths which were supposed to be the cause of structure at that time. A sharp pointed wire was introduced through a catheter, or catheters with sharp edges were passed with the view of lacerating the obstructing part. These measures were then followed by the application of caustics or medicated fogs and in this way dilatation was effected.
This seems to have been a combination of the three different methods of treatment already alluded to. Little is known of its success. It must have been often a prolonged and painful process liable to complicate the state of matters by forming false passages or injuring healthy parts of the urethra.

When the Pathology of this subject became better understood from the investigations of Hunter & Sir Charles Bell, it was found that organic structures of the urethra were not due to the growth of excrescences from the mucous membrane, but to infiltration of the submucous tissue with a plastic fibrinous material—a result of inflammation. This being firmly adherent to the mucous membrane was found to surround the canal for some part of its extent and to constrict it. Subsequently to this proposition were brought forward for dividing the structured part internally. The idea seems to have originated in France. It was practised and recommended by Chopart in 1823. He describes an instrument for the purpose and recommends its use in cases where the structure is anterior to the urethra as "the most prompt and certain cure."—Instruments of various
Kinds have been invented both on the continent and in this country, having for their object to make an incision of limited depth along one or both sides of thestructured part, either in passing the instrument (stilette) or in withdrawing it. They are now almost entirely abandoned in practice and it is unnecessary to describe any of them. There are great obstacles to their safe employment in a large majority of such structures as would be benefited by division.

1. The difficulty of ascertaining the exact extent of the structure and of dividing it accurately by such instruments.

2. The large majority of structures are situated at that part of the structure which is curved in direction and about five or six inches removed from the external orifice. According to some authorities the most frequent site is just anterior to the bulb; according to others at the junction of the bulb with the membranous portion (Simpson's Essay p. 81). Now it has been found that incisions made with these instruments in this part of the urethra are very liable to penetrate other parts in the neighborhood and can scarcely
be confined to the course of the urethra. Hence there
is danger of infiltration into the Perineum or
erectile tissues taking place. Mr Stafford in this
country in 1827 was the most prominent advocate
of this means of mischief and invented some
ingenious instruments for the purpose. He has re-
lated many cases of successful treatment by this
means of strictures situated at this part of the
urethra. He admits that the instrument requires
very careful hands for its use and in the greater
number of the cases he has given, the constitutional
disturbance was dangerous in degree. Frequent
leechings and fomentations were generally re-
quired to subdue it. Inflamed glands & testicles,
eyestis, and in one or two cases access to the
perineum followed. The results were still less success-
ful in other hands, &c &c
3. The depth of the mischief cannot be regulated
by these instruments and hence failure might
result as well from too slight as from too deep a
wound.

These objections all apply with greater force to
cases where the stricture exists behind the
descent, and therefore the condition of the
parts is more difficult to be ascertained than in the movable part of the urethra. Some go so far as to maintain that internal incisions are not justifiable in any circumstances. This I propose to consider after having noticed briefly the other methods of incision which have been resorted to, as one of the cases I have to relate is one in which internal incision was performed.

II. It has been often proposed in cases of obstinate or complicated stricture to cut into the urethra from without. Several operations of this kind have been put in practice;

(a) Below the seat of stricture.

The earliest operation of this kind seems to have been undertaken by French surgeons and some in England also, with a view to the relief of retention. It was known by the name of the boutonneira and consisted in making a small opening into the dilated urethra behind the stricture. There was no division of the stricture made. The first object was the relief of retention of urine, and the second, the cure of the stricture, which appears sometimes to have been rendered amenable to dilatation. It was strongly condemned by Chopart, who made trial.
of it. John Hunter appears to have improved upon it or at least added to it. He describes an operation by which besides making the incision in this situation he passed down a cannula through the urethra from above and another through the wound below and perforated the structure through the upper cannula by a probe, the point of which was received in the lower cannula. He relates a case in which he performed this successfully, for the cure of a structure, fistula in perineo—

Above the seat of structure

This was an operation undertaken directly for the cure of stricture, at least in some instances, but sometimes also resorted to in cases of retention of urine. The first description of it is given by Anstie:

A sound was passed down & firmly pressed against the stricture. An incision was then made on the point of the sound, usually in the middle line. The stricture was then divided by directing down to the urethra with the knife. Mr. Ardott of Middlesex Hospital facilitated the performance of the operation by recommending the use of a grooved silver probe when it could
be introduced through the wound. Another improvement was added by recommending that the incision should be made always in the middle line. A catheter was then passed and the wound allowed to heal. In this form the operation became known by the name of Perineal Section. When the guide could be passed from the wound the safety and facility of the operation were much increased, but it appears from reports of cases which have been published that it was often found practically impossible to pass the smallest guide in this way. Thus in the Lancet 1827 a case is related by Mr Cox of Birmingham. It was one in which structure had existed for some time and had been undergoing dilatation, but retention of urine suddenly supervened which would not yield to the ordinary measures for relief nor admit the smallest catheter. An incision was made laterally between the left crus and the urethra, which was opened on the point of a sound. The attempt to divide the structure seems to have failed and the bladder was perforated by a forceps and a tube through the prostate. The patient was in considerable danger for
some days but recovered ultimately, having been treated much in the same way as in lithotomy.

Mr. Green of St. Thomas Hospital also relates a case where inflammatory structure supervened upon some degree of permanent obstruction. He divided the stricture in the middle line of the urethra by cutting on the point of a catheter — with success, although he failed to introduce a guide. He strongly recommends as the result of his experience to make the incision along and not at the side of the raphe because "it facilitated the finding of the urethra and was safer where there was no guide."

Such was the old operation known as Rinaldi's Section. It has been found to be a difficult and formidable operation, and was only resorted to in cases of extremity. From the place given to it in the older works on surgery and structure it was evidently regarded as one which was very seldom required. Sir Charles Bell and Mr. Lisfranc have both performed it, and all agree in this, that they do not recommend the operation until a stricture was found quite impermeable.
to instruments. There seem to have been two cases in which it was resorted to: (1) When retention of urine supervened upon structure and could not be relieved by ordinary means. And (2) when an impermeable structure existed associated with a fistula in perineum, or in which although the urine escaped by the urethra in drops, the surgeon could not introduce any instrument.

It was attended with much danger to the patient. We invariably found that much perineal disturbance continued for some days under which the patient often sunk.

(c) The new operation of external division brought forward by M. Sayne in 1844 for the cure of certain structures of the urethra, although it does not exactly come into the place of the old operation, has greatly reduced the number of cases to which it would require to be applied. It has a different object to accomplish. It is not designed as a cure for impermeable structures in whatever way these may have been caused, but as the most effectual cure for strictures of two kinds which have been long known and
The irritable 2. The unyielding or resilient. These have been particularly described in the work of Sir Charles Bell. Of the irritable structure, he says: "There is a period of spasm and irritation when the smallest degree of inflammation will form fistula or burst the urethra." The remedies he applied were, very gentle dilatation, occasional use of the caustic, and general soothing measures. The result of his treatment he thus expresses: "While I only endeavored to correct the most urgent symptoms, I sometimes cured the disease, by relieving the patient from time to time. I found an unexpected case in introducing the tongue and by subduing the inflammation the firmness of the stricture itself gave way." These means are very often inefficient, and in cases where they have failed, all surgical operation has been found to give relief in some instances, by dividing the contracted part.

Of the 2nd class, the resilient stricture, Sir C Bell thus speaks: "There is no case in which a surgeon is more apt to be confounded, than when a patient comes to him with a stricture which..."
easily yields to the pressure of the bougie. After overcoming the difficulty he finds that he can pass the largest bougie with ease and the contraction seems to be destroyed. But although the patient sees a large bougie introduced into his urethra and cannot persist in saying that he has a stricture, he allows himself to be persuaded in opposition to his feelings, for his uneasiness continues. If after a few days he returns in his former condition, these cases were allowed to go on in this way, dilated from time to time until at last they were deemed fit subjects for perineal section. Mr Syme's operation is intended to apply to them as a means of cure when dilatation is found to give no relief. The principles on which the operation is performed are:

1. To insure accurate division of the stenosed part.
2. To make the incision exactly in the middle line.

These objects are easily accomplished by means of Mr Syme's grooved director—a staff, of which the straight part is of larger diameter than the curved terminal part. Along the convex side a groove runs
which is abruptly terminated when it arrives at the thick part of the staff. This instrument is passed through the structure until the thick part comes to press against it. In this way a sure guide is afforded to the knife which is arrested when the structure is divided by the termination of the groove. The incision is made from behind forwards. It has been fully described by Mr. Lyne in the Edin. Med. and Phys. Journal 1853 page 176.

The treatment afterwards consists in passing a full sized catheter and retaining it for at least 24 hours. After this the urine was allowed to pass partly by the wound, partly by the catheter, till it healed by granulation. In his later work on Clinical Surgery, however, Mr. Lyne advises the substitution of a perineal tube for the catheter, to be retained for a longer time so as to prevent premature closure of the wound, which he has found in some cases to be the cause of dangerous irritation. This, he says, is occasioned by "the urine breaking through a recently established union between the cut edges of the wound. The ordinary symptoms of this effect are, rigors, vomiting..."
vomiting and quick pulse, but in their more severe form, may be attended with delirium, suppression of urine, and sinking" (Clin. Surg. p. 21)

1. Difficulty may be encountered at the outset in the passing of the guide, this must be got over by careful dilatation in the ordinary way till the smallest of the instruments can be got to pass. Where there is great irritability, it can be done under the influence of chloroform. It is to be observed that in those cases which have been described as requiring the operation, the obstacle to successful treatment by dilatation did not lie in the difficulty of permeating the structure, but on carrying on the process of dilatation to a satisfactory result.

2. After the introduction of the guide the operation is easily performed. The skin and subjacent tissues are first divided, then the groove of the staff is sought for with the forefinger of the right hand and point of the knife, while the left hand holds the staff. The point of the knife is inserted behind the structured part, and then it is pushed forwards to the end of the groove. If the division is complete, the staff will pass on towards...
towards the bladder.

3. The danger of haemorrhage when the incision is made in this way is very slight. None of the cases operated on so far as I can find have been fatal from this cause.

4. The most dangerous consequence is that already alluded to as irritation, followed by rigor, nausea, sitting us attributed by Mr. Syme to the urine breaking through the healing edges of the wound. This has very seldom led to a fatal termination, yet its liability to do so must be recognized.

5. The cure has not been found by Mr. Syme to be permanent in all cases, without some recourse to dilatation subsequently. This he recommends to be done by passing a bongie at intervals of a week or fortnight for some time to prevent recontraction. In some instances and those from among the worst cases it has proved complete, but in others it has been found that although completely divided, the contraction has recurred. These will not be regarded as causes sufficient to deter from the performance of this operation. When it is remembered from
What practical suffering it is the means of relieving the patient, generally in the course of two or three weeks. Those cases which it thus disposes of, although long recognized and described were treated by caustics, dilatation, and sometimes even by cutting out a part of the urethra with very little hope of a successful result.

The following two cases of stricture I had an opportunity of observing in the practice of Dr. Ross of Dingwall, who has kindly allowed me to make a report of them. To the first patient I had the opportunity of acting as dresser and of watching the case closely through its progress.

Case I.

August 1860.

Donald MacKenzie, navvy, aged 45.

History
States that he has suffered from stricture of the urethra for the last twelve years. He says that it was the result of an accident received at his occupation, but on closer inquiry there was ground for supposing that it was the sequel of inflammation, probably gonorrhoeal. Repeated, and long continued attempts had been made by several surgeons to
dilate the structure, but without success.

This man originally tall & powerful, was by the long illness occasioned by this stricture & insufficiency of the bladder, reduced to a miserable state of weakness, so that he could walk with difficulty, and occasionally could scarcely turn in bed. Most of the day and night were spent in attempts to empty the bladder, & latterly he succeeded in doing so, only by pressing the urethra forwards by the finger, which had accumulated by great straining in the lower portion of the urethra. The consequence was that the pressing and stretching process had enlarged the penis greatly and also the prepuce to a great extent.

On examination, the orifice of the urethra was found to be a mere puncture, and on tracing the canal back from this point externally, it had to the touch a round, firm feeling, as if a large catheter had been introduced. This extended to the margin of the scrotum.

An attempt was now made to explore the capacity of the urethra, and after several failures, the smallest steel bougie was introduced into the bladder, and it became evident that the difficulty
difficulty principally arose from extreme rigidity of the walls of the canal, and also from several false passages, some of which were of late date. Several weeks were expended in increasing the size of the bougie. At last M'Keeley's wetter guide was introduced and the smallest of his tubes was passed over it. This was repeated again and again, during which time the patient suffered much agony and the condition of the structure remained unimproved, in the slightest degree. It was so thick and elastic that on withdrawing the instrument, it immediately contracted to its former condition.

It now became evident that the man would probably die from the misery produced by the disease, for no elastic catheter could not be introduced, and it was considered improper to keep a silver one in the bladder continuously. Dr. Ross, therefore, resolved to endeavour to relieve the patient by dividing the structure externally.

The smallest of all Tyndie's grooved directors was passed into the uretha, till the point reached to the serousum. A sharp pointed bistoury was thrust into the groove, just in front of the serousum.
carried along till it came out at the orifice. A catheter No. 12. was then readily introduced into the bladder and retained by straps, the patient being placed in bed upon his back. The wound was allowed to remain open for some hours, to allow the oozing to stop. The quantity of blood lost did not exceed two or three ounces.

The edges were then brought carefully together over the catheter by means of the twisted suture. An elastic catheter was substituted for the silver one and retained till the wound healed.

The patient passed a better night although from the irritable state of the bladder it required to be frequently emptied, from the force of its contraction the urine was apt to escape past the catheter and irritate the wound.

In consequence of this the edges ulcerated in part, the sutures coming away, and there was considerable difficulty in healing the incision. But by the careful application of strips of adhesive plaster, the edges were kept together, and the whole of the wound united firmly in 3 weeks after the operation.
This man continues (Dec. 1861) quite well; makes his urine quite freely, a No. 12 catheter can be introduced quite easily. His health & strength have so much improved, that six months ago he returned to his former occupation—that of a seaman.

Case II

September 1860.

A. A. 13, a shopkeeper, had experienced much difficulty in making urine for many years; and of late had suffered much from this.

On examining this patient it was found that the mucous of the prepuce had contracted, and that it adhered to the glans penis by a dense fibrous substance, surrounding the orifice of the urethra and part of the glans; so that the urine escaped by an extremely small opening which consisted of the contracted prepuce and orifice. On further examining the urethra externally, two portions of it were found enlarged & furred, exactly as in the Case No. I.

The first dilated portion was situated at the orifice; the second just in front of the scrotum. The former was about half an inch, and the latter three quarters of an inch in length. When the
The penis was stretched.
Some difficulty was experienced in introducing the
smallest bougie, and from the experience obtained
in Case I. The idea of carrying on the treatment
by dilatation was not entertained.

The prepuce was in the first place slit up
and separated from the glans penis to which it
was in great part adherent. It was then
partially removed.

In a month after this, the urethra was di-
lated so as to admit a straight silver
director, and it was resolved in this case to
try internal division of the structure.

Along this straight director, a narrow knife
about an eighth of an inch in breadth, with a
strong back, was pushed gently so as to pass
through the structures. In drawing it out both
the structured parts were divided at once.

Care was taken to divide the thickened wall
of the canal only, leaving the tissues external
to this uninjured.

A catheter, No. 12, was at once introduced
into the bladder and fixed there.

There was very little bleeding. The wound in a
few days suppurated, and in 10 days the

catheter was discontinued. The patient

was directed to pass the catheter once a week.

Twelve months after the operation

Sept 1861 a catheter No 10 can be introduced

by the patient himself, and he considers

himself perfectly cured.

Remarks.

The two cases related above of structure of

the urethra, are very similar in character, and

at the same time not very common.

In the first Case, the attempt to remove the

structure by dilatation was a decided failure.

It was not even temporarily benefited by that

means, and there can be no doubt that if it had

been the plan of treatment in the second Case

it would have failed also.

The progress of the first Case was satisfactory

in all points except one— the healing of the incision.

This was found to be a matter of great

difficulty, because—

1. It was absolutely necessary to employ sutures

from the first, to bring the edges together and

thus keep them in contact.
2. When there became detached by ulceration, to some extent, adhesive planter had to be carefully applied so as to close every opening.

The careful repeated application of this was fortunately successful in healing the wound in this case, the patient having suffered no constitutional disturbance whatever. But in a less favourable case there would be a considerable risk of the urethra remaining patent.

There was, therefore, cause for some hesitation to make such a lengthened incision in the same situation in the 2nd Case. In it the result was more satisfactory in this respect.

The incision made simply by the knife, with the assistance of a director was found to be more easily managed, and more precise than it could be by the use of the urethrotome.

By the introduction of the catheter the urine was prevented from irritating the wound till plastic evulsion had taken place.

There seemed to be not the slightest sign of constitutional irritation, and the patient was well in less than half the time after the operation which was required for
the other Case-

These cases presented a very favourable opportunity of seeing the elastic or resilient structure. Its situation at the orifice facilitated the easy approach, the orifice, and continued orifices of the bladder, was seen to be surrounded by a white collar of a dense cartilaginous-looking substance which extended far beyond the point of a small bougie well fitted when introduced, and contracted with great force on its withdrawal.

On account of the situation also, these were very inviting cases for the trial of internal division, where the structure to be divided was in part visible at the passage of the knife. I have already stated that Chopart in 1823 recommended internal division in cases where a structure of this kind was situated anterior to the urethra. In the same way it seems to have been an operation occasionally performed by surgeons, much before this time, as an exception to the general rule. Both Hunter and Sir Charles Bell have recorded cases of
the kind which they treated successfully. Sometimes
they made also an opening into the dilated part
of the urethra behind, but this was done in order
to prevent the formation of a false passage, as
they usually pierced through the structure from
above.

Dr. C. Bell, in his work on Injuries p. 83
says "In very obstinate stricture attended with con-
tinued and ineffectual straining & violent parox-
smus of pain, threatening the total overthrow of
the patient's constitution, I have been induced
to consent to a more speedy removal of the
obstruction." He then relates two cases in which
he perforated the structure. One of these he thus
describes "There was a callous & vitriolate jetula
in the perineum, about 4 1/2 inches from the
extremity of the urethra, a stricture of at least
an inch in length which was felt like a cord
through the integuments of the penis, & up to
this point the streams of urine came with great
force distending the canal of the urethra to 1/2
an inch in diameter." The other case was some-
what similar & if an external opening was
also made. It is remarkable that there were
the only two cases of this character which he had
I have also alluded to the more recent attempt of W. Stafford to this to apply the method of internal division to these structures when situated at the bulb. This attempt has not met with much success although it has been tried extensively in France & in England. The result has proved, I think, that such structures have on many instances been cured, even in this situation by internal division. But there is so much difficulty in performing the operation & so many risks to the patient, that the general opinion of the profession is decidedly opposed to it. Even were it possible by means of these instruments, to make the incision safely and accurately, dividing the morbid texture from the rest, there is no reason to prefer this to the Flurin's operation. For

1. a wound in this part of the acethra has been proved to be attended with greater danger when made internally, than when made from the fenestra; even attempts in

filtration of urine be successfully guarded against

2. There is no difficulty experienced in healing.
the external incision in the perineum, and therefore it is not such a formidable operation and does not require a more lengthened period for recovery.

I think on these grounds the attempt should not be made to divide structures internally which are situated near the bulb. But when a structure of this kind requiring division exists in the anterior part of the urethra, I cannot see why internal division should not be performed when it can be performed in the manner adopted in Case No. 15 related above. Here no bad effects are liable to follow. There is no danger of infiltration or of constitutional disturbance. The occasional passing of a catheter effectually prevents recontraction and completes the cure, and the procedure is altogether preferable to the formidable incision which was practiced in the 1st Case.

It may be objected to this, that the internal incision cannot have the same effect in overcoming the morbidly indurated & elastic condition on which the contraction depends, as when a free opening is made externally, and that, therefore, the
disease will be liable to recur.

This is entering on the Pathology of the question - a subject on which little has been said.

Since dilatation is held to act by producing absorption, from the effects of pressure stretching, when this fails in the case of old and bad structures, it must probably be owing to the affected material having become too highly organized to be removed by this means. It is well known that this is the case with other effusions, as into the Pleura, where they become cartilaginous & assume a character.

Besides this an elastic condition is acquired which contracts the process of dilatation.

In cases such as these, division of the part affected brings about absorption of the morbid substance and restores the normal condition of the urethra in a short time - What are the circumstances to which cure or leading to this result?

1. There are the effects of rest - the tension and spasm of the patient are reduced. The irritable state of the bladder is restored. The tends no longer

2. The wound is not allowed to heal by first intention, but more or less of ulceration lasts.
place, which has a very powerful effect in causing absorption and was employed for this purpose by the old surgeons when caustic was applied to the wound.

3. By complete division of an elastic texture such as exists in these cases, its tendency to contract is overcome and prevented.

All these effects are equally secured by dividing internally by the knife. A catheter can be passed, if the division has been complete and retained. Suppuration of the division takes place and the ulceration soon disappears. The effect is kept up in the same way by occasional dilatation till the cure is complete.