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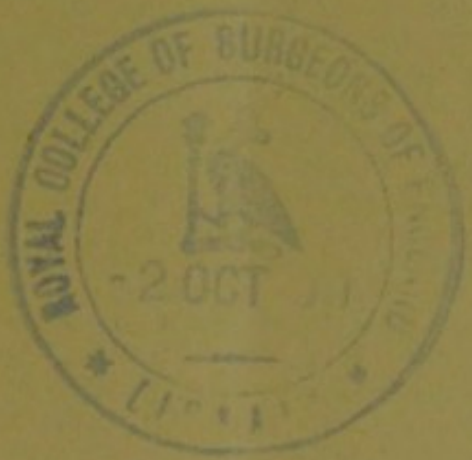

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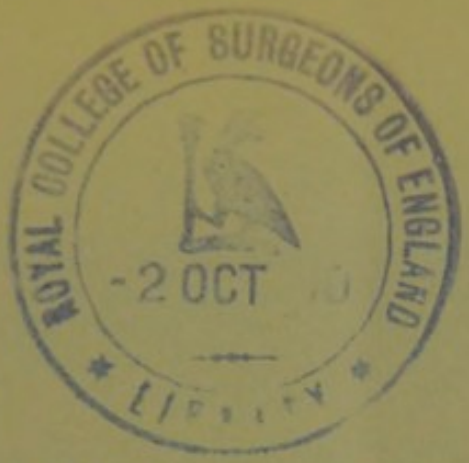

THE REMOTE RESULTS OF STRUCTURAL LESIONS ("INTERVENTIONS SANGLANTES") IN URETHROSTENOSIS.[1]

I HAVE been asked to report to this Congress on the remote effects of structural lesions (*interventions sanglantes*) employed in the treatment of stricture of the urethra. I think it will be generally admitted that these results are mainly determined by the nature of the wound and the circumstances under which it healed. For instance, incised and contused wounds and wounds that heal without any or with much inflammation, or with little or no provision for drainage, may be expected to yield different results. For this happens in all parts of the body. But in estimating the results of structural lesions of the urethra we must never lose sight of the fact that this canal conveys for several inches, at varying intervals, a compound and complex fluid which, under certain conditions not very clearly defined, is capable of exercising a highly poisonous effect on the tissues and fluids of the body with which it may accidentally come in contact. This is evidenced by the frequency of rigors and fever not unlike a malaria after slight lesions, such as passing a catheter or dividing a stricture, by the sudden suppression of urine which is sometimes similarly occasioned, by the happening of serious, if not fatal, septicæmia later, and more remotely by the formation of a contractile scar at and about the seat of the wound. Surely we may say that the pathology of the urethra is a unique one.

To compare their results it will be necessary to define with some accuracy the kinds of wounds that preceded and their probable process of healing. For the purposes of this report the following varieties have been examined and carefully studied both during life and, as opportunity offered, after death: (1) lacerated or contused wounds as follow such methods of divulsion as were practised by Perrève[2] in Paris

[1] A paper read before the Thirteenth International Congress of Medicine in Paris on August 8th, 1900.

[2] Traité des Retrecissements Organiques de l'Urètre. Emploi Methodique des Dilateurs Mécanique dans le Traitement de ces Maladies, Paris, 1847.

and Holt[3] in London; (2) incised wounds from within the urethra as illustrated by Maissonneuve's[4] and other kinds of internal urethrotomy; and (3) incised wounds from without inwards as described by Syme[5] of Edinburgh under the name of "external urethrotomy" or perineal section.

1. Wounds inflicted by instruments for rapidly causing divulsion or rupture of a stricture are usually of a contused or lacerated character. When thus employed, unless the stricture is an annular or a ring-like one, a condition which is rare, the canal usually gives way at a point in its circumference where the resistance is least, and this is naturally not the densest portion of the contraction. Hence these operation wounds heal not unlike accidental lacerations of the urethra from injury, and in both instances the liability to stricture and to its recurrence is considerable. This was found to be so in cases examined both during life and after death and repeated operations by divulsion appear to have been followed by additions to the amount of contractile scar-tissue at or about the seat of stricture. There is, however, a form of stricture where divulsion is not open to these objections as judged by its more remote effects. Reference is here made to what are known as peri-urethral or sub-mucous strictures. My attention was first called to them some years ago by examining a patient who died from some other cause shortly after (within a week) a tight stricture in the deep urethra had been divulsed by Holt's method. The stricture was found to be peri-urethral and it thus compressed the mucous coat as a ligature round it would do. The effects of the divulsion had been to rupture the fibres of the stricture whilst it left the mucous lining almost intact. Mr. Christopher Heath[6] has also recorded a similar observation. I am inclined to think that the consequence of its casual application to this class of cases and the excellence of the results was that Holt's operation attained a position regarding the treatment of strictures generally which it hardly appears to have merited. No better result relative to the permanency of the cure can be desired than this and if it were possible to limit divulsion to peri-urethral strictures I believe this operation would still be frequently employed. I have examined several urethras many years after Holt's operation had been performed where the canal had maintained its full measurements and no trace of a lesion of the mucous membrane could be found. We may claim these as instances of the successful treatment of stricture by subcutaneous, or rather submucous, methods.

2. The remote effects following internal urethrotomy are of a variable character, arising mainly from the nature of the

[3] On the Immediate Treatment of Stricture, London, 1861.
[4] L'Urethrotomie Interne, Paris, 1879.
[5] On the Treatment of Strictures by External Incision, 1851
[6] Brit. Med. Jour., July 17th, 1869.

cicatrix or scar-tissue that follows the operation. In some instances I found from examination after death several years afterwards that no signs of the original stricture were discoverable either in the mucous membrane itself or in the submucosa. As far as I could ascertain the incision made by the urethrotome had soundly healed without leaving any mark or contraction. As illustrating this class of cases I will select one that has recently come under my observation where the previous history was well authenticated throughout. It was that of a man, aged 53 years, whom I saw in February, 1900. He was operated upon in 1883 by the late Mr. Berkeley Hill for a stricture in the deep urethra which would only then admit a filiform bougie. Internal urethrotomy was performed. I saw and examined this patient with Mr. C. B. Lockwood, who had been personally aquainted with him throughout. I could find no evidence of stricture. The patient had ceased to use a bougie for some years. There could be no question that this man had been permanently cured by the operation.

On the other hand, the majority of instances examined showed in varying degrees that a tendency to relapse occurred within a few weeks or months after the operation, even where patients had endeavoured to prevent this by the use of a bougie. In these, for the most part, there were signs that the wound inflicted had probably been an irregular or jagged one, more resembling a lacerated wound than an incised one, and not what would be expected from a well-constructed urethrotome. Further, the resulting cicatrix often presented an appearance not unlike what happens after a burn of the second or third degree, or as I have seen following electrolysis for stricture.

In some instances of recurrence after internal urethrotomy it was apparent that this operation had only partly divided the stricture. From the evidence that was afforded by this class of cases it was concluded that the combination of partial incision of a stricture by internal urethrotomy, followed immediately by stretching of the wound thus made by divulsion or bougies, did not yield good permanent results. It was in some of these cases that recurrence took place most speedily and in an aggravated form.

3. The third group of cases examined were those where the stricture was divided from without inwards on a grooved staff in accordance with Syme's description of external urethrotomy or perineal section. In several instances where this operation had been practised some years previously I found no recurrence had occurred, though the use of a bougie had practically been discontinued. I have recorded[7] a case where a patient, aged 46 years, had been operated upon by external urethrotomy for stricture and urinary fistulæ by a former colleague of mine in 1867. He died 18 years afterwards, and on examining his urethra I could find

[7] Surgical Disorders of the Urinary Organs, fourth edition, p. 100.

no sign of stricture. The dimensions of the canal along the line where the section had been made were larger than the rest. The patient had not been in the habit of using a bougie since the operation.

It will not be necessary further to illustrate the permanent advantages that have followed perineal section in some cases of urethral stricture. In restoring and preserving the normal dimensions of the canal and in rendering catheterism easy where previously it was difficult its advantages must be apparent in cases to which it is applicable, and these include some of the worst varieties of stricture. If performed without a guide the prospect of a good result is very small. Where practised successfully it was not easy to determine how much of the permanent good that resulted was due to the complete division of the stricture and how much to the drainage which the external wound provided ; but it seemed probable that both contributed to this end.

Taken as a whole, these investigations support a conclusion that most strictures treated in the three ways referred to, showed a tendency to re-contraction in varying degrees. In some this liability was easily counteracted by the use of bougies after the operation, though practically it could not be said that there was any time limit to this expedient. In others the tendency to relapse was so rapid and strong as to require repeated operations to maintain the dimensions of the canal, or even to necessitate the formation of a urinary fistula in place of the urethra. In a few instances, after rapid divulsion, internal urethrotomy, and perineal section or external urethrotomy, the evidence was conclusive that a permanent cure had resulted, and in such cases the subsequent use of a bougie appeared precautionary rather than necessary. It must, however, be stated that, compared with the large number of stricture cases which were investigated for this purpose, and where the observations extended over a considerable number of years under favourable circumstances for conducting such an inquiry, the instances last mentioned were rare. These conclusions will, I think, correspond with the experience of most surgeons.

I take it that the object of this report is not merely to reiterate a foregone conclusion but to explain, if possible, how these variations may have happened, and how both good and indifferent results may alike contribute to advance knowledge in connexion with this subject. In examining the lesions thus made for the treatment of certain forms of stricture by urethrotomy, and I include both varieties of operation under this term, it was evident that some of them had been faulty in their application and in their construction relative to the process of healing which would follow. In a few instances appearances indicated that the incision or incisions had not been accurately applied to the constriction, that the urethrotome had lacerated rather than cut, that several wounds had been made in various directions, and thus by scar-tissue the obstruction was rather added to than lessened by what had been done. This was probably directly

due to faulty instruments in the case of internal urethrotomy and to want of precision and completeness in carrying out the details of perineal section. Though some failures may be accounted for in these ways, more were evidently due to the conditions under which healing proceeded after the operation. Many of the incisions that were made for the purposes of internal urethrotomy were inadequately provided with means for proper drainage, having regard to their extent, whilst some cases of perineal section or external urethrotomy were hardly any better off in this respect.

About the time I commenced to make these observations on a somewhat extended scale internal urethrotomy was being practised with a very free hand. The late Professor Otis of New York had recently formulated his views relative to the male urethra which to some extent were responsible for this. Though fully recognising the value of his work in demonstrating the greater capacity of the male urethra and the important influence that this had on the new lithotrity or litholapaxy which Bigelow was developing in the wake of Otis's investigations, I could not follow him in the practical application of it, in its entirety, to the treatment of stricture. However, it tended in the direction of increasing the range of internal urethrotomy as well as the size of the wounds thus made, but I cannot say that it proportionately added to the number of cures in chronic stricture of the deep urethra. It struck me in examining cases which had been thus operated on some years previously by various surgeons where the stricture had recurred that the size or depth of the wound so made was out of proportion to the facilities for drainage, whilst healing was going on, which the urethra alone afforded. In the absence of the latter condition I recognised one reason for the contractile condition of the scar that resulted. In arriving at this conclusion I was much influenced by what I had observed in connexion with the treatment of accidental lacerations of the deep urethra by perineal incision and drainage.

It may be generally stated that the worst forms of strictures are those following laceration of the urethra, and considering the circumstances under which such lesions usually heal this is not to be wondered at. Repair goes on slowly under the irritating influence of constant contact with confined urine, and excessive exudation about the seat of the wound takes place. This eventually, in conjunction with the irregularity caused by the wound, forms a stricture of the closest and most contractile character. On the other hand, in cases where perineal section and drainage were applied, this either did not happen at all or to a much more limited extent. In some instances where this principle was adopted in the case of ruptures of the deep urethra, healing took place just as kindly as it usually does after a median cystotomy, and no stricture followed. This I proved in many instances. It seemed reasonable to conclude that the treatment of stricture by section, or division of the stricture, might be improved by providing better drainage for urine and

the discharges from a wound which can only be imperfectly treated antiseptically.

I am not aware that the influence of urine-drainage and irrigation in relation to the healing of wounds of the urethra and the kind of scar-tissue that results have ever been adequately discussed in connexion with the operative treatment of urethral stricture. With the view of meeting what I consider to be causes of failure and recurrence following some operations, I published [8] a series of cases and observations where I had combined the principles of internal and external urethrotomy in the treatment of certain forms of urethral stricture which on the whole have afforded good results. I shall best illustrate this practice by a typical case which was recorded and watched for a considerable number of years.

A man, aged 51 years, whom I saw and operated upon in 1890, had been the subject of a stricture with a strong tendency to contract for some years, and had undergone no less than six operations for it, including a divulsion by Holt's method, and five internal urethrotomies at various intervals and places. For some months before I saw him the stricture had been contracting and closing in spite of the patient's well-directed efforts with suitable bougies to keep it open. Straining to urinate was constant and prevented continuous sleep, and there was some cystitis with probably pyelitis. I performed an internal urethrotomy with Teevan's modification of Maissonneuve's instrument, as I thought that the latter might not stand the strain put upon it by the cartilaginous character of the tissues which had to be divided. This being done I passed a full-sized grooved staff (No. 12 English) into the bladder. As the staff was evidently gripped in the deep urethra the patient was placed in the lithotomy position and I divided in the median line from without inwards such contracted tissues as remained. I thus opened the urethra and found by passing my finger first into the bladder and then hooking it forwards along the urethra in the direction of the penile orifice that the walls of the canal had now been rendered free and unresisting. A full-sized gum-elastic drainage-tube, such as I have elsewhere described [9] was passed into the bladder through the wound and retained. The parts were washed out with a solution of perchloride of mercury (1 in 6000). The stiff drainage-tube was withdrawn on the sixth day and a soft rubber one fitted with a tap for the voluntary withdrawal of urine was substituted which was worn for a fortnight longer and then finally removed, when the wound soon healed. Ten years have now elapsed since this operation was practised. The patient remains in good health and suffers no further inconvenience from his urinary organs than having occasionally to pass a full-sized bougie for himself.

It may be thought that the retention of a catheter in the bladder for some time after an internal urethrotomy has

[8] Brit. Med. Jour., July 18th, 1885. [9] Op. cit.

been practised is to be preferred to an external urethrotomy, and a perineal tube for drainage alone. In some instances the former may suffice, but in the majority of cases where a urethrotomy becomes necessary it will be found an imperfect substitute. The mechanism for the retention of a catheter along the whole length of the urethra and the irritation it excites are often obstacles to the successful employment of this expedient.

The conclusions arrived at from the examination of structural lesions used in the treatment of urethral strictures as detailed in the foregoing remarks may be summed up as follows.

1. That there is evidence to show that in peri-urethral strictures of the deep urethra the effects of divulsion as practised in Perrève's and Holt's operations may be limited to rupturing the dense stricture bands in the submucosa of the urethra, whilst the mucous membrane itself escapes any serious injury or laceration and is merely restored by stretching to its original dimensions. Here a permanent cure may result. On the other hand, where the mucous membrane is in itself the seat of stricture and forms part of the latter structurally it is necessarily torn or lacerated by the process of a sudden divulsion, and the pathological condition consequently becomes assimilated with that of traumatisms of the urethra from external violence accidentally applied which are followed by strictures of the most contractile and recurrent form.

2. That there is evidence to indicate that where the entire thickness of a stricture can be included within an incision of moderate dimensions made by an internal urethrotome the normal calibre of the urethra may be completely and permanently restored. Where this happens it may be concluded that all the fibres of contraction constituting the stricture were divided at the time of operation. And further that the converse is equally true. There is also evidence to show that the absence of recurrence under such circumstances is not necessarily dependent on the use of a bougie, though the latter is a precautionary measure which should invariably be advised.

3. That in the case of multiple strictures or strictures of the deep urethra of considerable dimensions either in their length or thickness treated by an internal incision of corresponding proportions, apart from other considerations, the tendency to recontraction and recurrence, with an additional amount of cicatricial material, is frequent; the latter being probably due to the circumstances under which healing takes place in wounds of these dimensions so situated.

4. That lesions of the urethra demonstrate in various ways the poisonous effects that unprotected and confined urine is capable of exercising both on the body generally and

on the tissues in contact with it, and that the liability to such effects is greatly diminished where drainage and irrigation render these conditions of the urine unlikely.

5. That in the case of recurring strictures previously treated by incision and in primary strictures of such length or extent as to require an internal section of a corresponding size, or as to which there might be doubt as to whether it would be safely possible so to include them, for the purposes of the operation and its results such wounds should be made with due regard to other surgical principles in addition to the one pertaining to the division of the contraction.

6. That there is direct evidence to show that the tendency to recontraction and recurrence of stricture after internal urethrotomy is largely diminished by the concurrent employment of systematic and efficient urine and wound drainage such as the combination of external urethrotomy, or perineal puncture, affords.

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