WILLARD (DeF.)

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Presented by the author

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t is doubtless expected by your Society that I should discuss this question chiefly from the surgical aspect, but you may discover in this as in other conditions that the surgeon is sometimes less radical in his views than the medical man.

I have had considerable experience in the treatment of these cases upon the lines of treatment by rest, by fixation of the spine, by extension in the horizontal position and by alteratives as well as by laminectomy, and am compelled to say that thorough enforcement and proper application of the methods named have been successful in a very large majority of cases in securing improvement in a year's time, and that this improvement ordinarily progresses until locomotion of good degree is finally secured.

In looking back over the work of thirty years I can recall very few cases which have remained permanently paralyzed.

The prognosis, judging from my own experience and from that of others, is eminently favorable, but improvement is to be accomplished only by the utmost patience on the part of the individual and his friends, and by untiring watchfulness and much skill on the part of the surgeon.

As I have indicated in this outline, radical surgical interference in the shape of removal of the laminæ to relieve the element of compression should not be undertaken until less dangerous forms of treatment have been most assiduously and patiently tried for a long period of time. Formerly it was my rule not to interfere until at least a year of rigid treatment had been tried; now, I am inclined to lengthen this period somewhat, and in certain cases to

continue it for at least a year and a half, even in the face of non-improvement.

I am led to these conclusions, first, by the fact that certain cases do improve even after a year's apparently hopeless treatment. Secondly, by the high mortality of the operation, as shown by statistics. Thirdly, by the fact that the temporary improvement accomplished by the removal of the tubercular mass surrounding the cord is, unfortunately, not assuredly permanent, but that an increase in this deposit may reproduce the symptoms in as aggravated a form as before the operation.

I do not condemn the operation; on the contrary, I occasionally practice it; in selected cases it has its legitimate place in surgery when other measures fail.

When the operation was first introduced, or I may say, revived, some fifteen years ago, the primary brilliant results secured by Macewen, Horsley and others, aroused the hopes of surgeons to a marked degree. My own first operations were so satisfactory as to results that I was greatly encouraged in regard to these cases which are necessarily most distressing and disheartening. The occurrence of fatal results, however, and the relapse of cases operated upon, led me to examine the statistics more thoroughly in relation to the operation itself and its final results. I must confess that I was dumbfounded when, in a collection of 134 cases, secured for me by Dr. Rhein, I found that other operators were no more fortunate than myself, and that the immediate mortality from shock was 24 per cent., and that of those who died within the first month (that is those whose lives were undoubtedly shortened by the operation) the mortality was 36 per cent.—more than one-third of all the cases.

We may, I think, also reasonably infer that the lives of those who died within the year after operation were probably shortened, and, according to these statistics, nearly one-half (46 per cent.) of the number of cases operated upon have had their lives abridged by surgical interference—a most discouraging mortality for a condition which, while serious, does not immediately threaten life.

It is true, that a certain percentage of cases will naturally die from tubercular meningitis, general tubercular infection, septic infection of the cord or system, etc., yet the number of such complications is limited.

Let us examine statistics again in regard to the bene-

fits derived from operation. It is difficult to draw absolute conclusions. A number of the cases have been placed upon record a few months after operation and the subsequent history is unknown. It is impossible to say whether the reported improvement has continued, whether relapse has taken place or whether death has resulted later.

Taking the published reports, however, which probably represent the best results, about 65 per cent. may reasonably be placed in the category of deaths or "not materially improved."

It should be remembered, however, that the condition, on the other hand, is one of great gravity, and that the operation when performed is only employed for the benefit of the most stubborn and intractable cases, whose improvement under ordinary treatment is hopeless.

The merits of the operation itself should not then be judged by the figures given in statistics. I believe in the operation for certain cases; in fact, I have performed it within the last two months, although, I regret to say, with a fatal result. The case was, however, one of stubborn severity and, in my opinion, demanded surgical interference.

When it is considered, therefore, that only the most hopeless cases are subjected to operation, we must anticipate the improving of only a small percentage of cases.

In regard to the operation itself, I presume that I have performed it as frequently for this condition and for traumatism of the spine as any American surgeon, but abroad the operation has found, especially with Kraske and Lane, greater favor than it has on this side of the Atlantic.

I have not found the operation as simple as some writers would indicate. In my first attempts upon dogs and in my later experiments with these animals in spinal surgery, as well as in operating on the human being, I have found the shock very considerable, and if the hemorrhage is great, as is often the case, shock is increased.

A surgeon who has performed the operation only in the upper dorsal region realizes but little the difficulties that are encountered in the lower dorsal or lumbar region. The great mass of muscles of the erector spinæ group bleed most profusely, and the intraspinal veins also pour out blood in large quantity, adding seriously to the already exhausted condition of these cases.

The large amount of hemorrhage is one of the objec-

tions to the raising of the osteo-plastic flap, as proposed by Urban. I have tried this procedure twice, but have encountered the difficulties already mentioned. The hemorrhage also delays the operation, which is another element in the production of shock. I do not think that the replacement of the arches compensates for the objections named.

This hemorrhage can be avoided to a certain extent by keeping close to the spinous processes in clearing away the muscles, and is still further lessened by a single incision and the cutting off the several spinous processes "en bloc," as proposed by Abbe, the connected processes being then slipped to one side to permit the laminal slope to be attacked.

I usually make the skin incision a little to one side of the spinous process to avoid cicatricial pressure afterwards. As the hemorrhage is largely venous, packing and catch forceps are usually sufficient to close the vessels and ligatures are seldom required.

The only real difficulty in the operation is the removal of the first lamina. Sharp, double-jawed, ronguer forceps work best, but Hey's, or other form of short saw may be employed.

When once the cord is exposed the other laminæ are easily cut away with narrow ronguer forceps with flat lower blade.

Removal of tubercular material about the cord should be carefully accomplished, but handling of the cord should be avoided. Each manipulation of this structure adds to the shock of the operation, and I have seen most marked alteration of the pulse and respiration during the handling of the cord. No finger but that of the operator should be allowed to touch it, and sponging should be accomplished with caution.

When there is anterior bone pressure the cord may be rolled to one side and any sharp projection removed, but extensive attack upon the body of the vertebræ must be done from the side, not across the cord space.

Frequently it is impossible to remove all of the tubercular cells, hence a relapse can only be avoided by the removal of posterior pressure and the subsequent improvement of the general condition. Opening of the dura tends to the admission of tubercular cells within the cord.

Conclusions.—

1. Prognosis in pressure paraplegia is hopeful unless the cord has been actually destroyed.

2. Laminectomy for spinal caries paraplegia should never be undertaken until at least one year of persistent treatment by rest, fixation and extension (together with alteratives, etc.), has been most patiently tested.

3. The dangers from the operation are shown by statistics to be great, 24 per cent. dying from the immediate shock, 36 per cent. within one month and 46 per cent. within one year. At least 65 per cent. either die or are not improved by operation.

4. The dangers are hemorrhage, prolongation of the operation and manipulation of the cord.

5. In spite of these risks the operation has its place in surgery and is justified in selected cases when persistent and carefully applied measures have failed.

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