RESECTION OF THE SMALL INTESTINE IN THE PRESENCE OF INTESTINAL OBSTRUCTION

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Introduction

Resection of the small bowel in the presence of intestinal obstruction has a high mortality, and from time to time surgeons try modifications of the classical methods of resection and anastomosis in an endeavour to reduce the mortality.

It is well known that no one individual surgeon has, during a surgical lifetime, sufficient personal experience of this condition to form any opinion based on any large number of cases, for as his experience grows he performs fewer of these operations, the majority being performed by younger surgeons—surgical registrars and resident surgical officers.

The object of this communication is to endeavour to present some of the recent trends which have become apparent, in resection of the small bowel, and to find out the procedures which are being used at the present time.

General Considerations

Before considering in detail certain aspects of the problem some well-established facts stand out from which it is legitimate to deduce certain conclusions.

1. Exteriorization alone, has a higher mortality than primary resection and anastomosis, but this may be due to the fact that usually the case in which exteriorization is performed is in a much worse general condition than the one in which resection and primary anastomosis is performed. One, therefore, cannot condemn exteriorization by comparing it with resection and anastomosis.

2. Resection and anastomosis of the unobstructed small intestine has a much lower

mortality than resection and anastomosis in the presence of obstruction. The fact that intestinal obstruction is present is of great importance in increasing the mortality.

The actual operative procedure of resection and anastomosis is not in itself the whole cause of the great difference between the mortalities of gangrenous and non-gangrenous obstructed intestine, but it does play some part because in any comparable number of cases of small bowel obstruction where the site and duration of the obstruction is approximately the same, the mortality is undoubtedly greater in those for which resection is necessary.

3. It is our impression that the mortality of resection is lower in the acute strangulations caused by bands than in those such as small strangulated femoral herniae where the obstruction has usually been present for a much longer time.

Factors affecting the mortality

It is probable that the following factors affect the mortality.

1. The general effects of intestinal obstruction, whatever these may be, taking into consideration the age and general condition of the patient. This factor can be influenced by treating such patients sooner and by the use of intestinal suction to counteract the effects of intestinal distension. Intestinal decompression should be started at once and continued during the operative and post-operative periods until the bowel regains its tone or the patient dies.

2. Fluid loss particularly in high small bowel obstructions is a well-known lethal factor and is easily treated by the intravenous administration of fluid.

3. Blood loss is of considerable importance in strangulating obstructions where a considerable length of bowel may be involved. This should be adequately treated by the administration of blood or plasma.

4. Peritoneal contamination and operative procedures. The avoidance of peritoneal contamination has received considerable attention by many surgeons who have employed ingenious methods of aseptic anastomosis.

It is extremely difficult to assess the importance of peritoneal contamination, but it is reasonable to assume that it plays some part in influencing the mortality.

Measures to be used in reducing the mortality

There is general agreement that certain measures which are well known have helped to reduce the mortality rate. The most important of these are :

1. Intestinal suction.
2. Replacement of blood volume.
3. Replacement of fluid.

When one comes to consider the choice of operative procedure one finds that there is much less unanimity as to the procedure of choice. It is with this question that this communication attempts particularly to deal. It is necessary to consider some of the more usual procedures for dealing with gangrenous bowel.

Operative Procedures

The following are some of the more usual procedures for dealing with gangrenous bowel of such an extent that the area cannot be treated by simple invagination.

1. Exteriorization.
 - (a) Formation of a simple faecal fistula.
 - (b) Application of Paul's principle to the small intestine.
 - (c) Exteriorization with intra-abdominal entero-anastomosis.
2. Resection and Anastomosis.
 - (a) Open
 - (i) End-to-end.
 - (ii) Side-to-side.
 - (b) Aseptic (closed).

It has already been mentioned that the results of exteriorization are worse than those following resection and primary anastomosis, but exteriorization possesses certain advantages in that there is no intraperitoneal suture line to give way and the enterostomy, if it functions, allows decompression of the obstructed intestine.

The disadvantages are that secondary operations are required and a fistula particularly if high in the small intestine is badly tolerated. Exteriorization as a procedure cannot, however, be condemned without much additional evidence from very large series of comparable cases.

Primary resection and anastomosis is undoubtedly the procedure most commonly employed and to investigate this the following investigation was undertaken.

The questionnaire given below was addressed to the resident surgical officers or their equivalents, at a number of hospitals, and several surgical colleagues also kindly filled in the questionnaire. Replies from 16 hospitals in England and Wales were received.

I should like particularly to thank all those who co-operated in the investigation.

Questionnaire

1. Number of resections performed.
2. Do you prefer an end-to-end or side-to-side anastomosis ?
3. Do you employ an open or closed (aseptic) anastomosis ?
4. Any other method or modification ?
5. Comments.

Hospitals who replied

Royal Devon and Exeter Hospital, Royal Hospital, Wolverhampton, The Halifax General Hospital, The Kent and Canterbury Hospital, North Staffordshire Royal Infirmary, Stoke-on-Trent, Royal Surrey County Hospital, Royal Portsmouth Hospital, Royal Lancaster Infirmary, Northampton General Hospital, Royal Sussex County Hospital, Brighton, Royal Victoria Hospital, Bath, Crumpsall Hospital, Manchester, Brighton Municipal Hospital Services, City General Hospital, Leicester, Manchester Royal Infirmary.

Results of Questionnaire

The replies to the questionnaire brought out many interesting points, as it represented the experience of a number of surgeons with over 200 cases.

1. Side-to-side anastomosis is more usually employed than end-to-end anastomosis, and even among those who favour end-to-end anastomosis there are many who admit that they employ side-to-side anastomosis where there is much discrepancy in size between the proximal and distal bowel.

2. Open anastomosis is used almost universally with a few exceptions. This is also the experience of Chesterman (1945).

This question of aseptic anastomosis is of importance as recent American surgical literature lays great stress on the importance of aseptic anastomosis in avoiding peritoneal contamination, but the writer's impression is that its use in Great Britain must be very small.

What the importance of this is we do not know, but it would appear that aseptic anastomosis should be given a wider trial than it at present enjoys.

However several experienced surgeons have written to the effect that so far as they know they are not aware of any patient who directly suffered from an open anastomosis.

3. Enterostomy as an additional measure above the site of the anastomosis is used more by the older experienced surgeon.

The question as to whether enterostomy is necessary when intestinal suction is employed is also one of importance.

An enterostomy performed on a paralysed and distended bowel may drain little or nothing, while intestinal suction will remove gas and fluid from the intestine and help it to regain its tone. However, in such cases successful intubation of the intestine may be virtually impossible.

4. One point which did not come out of this investigation but was noted in a study of cases treated by or under the supervision of the writer, is that where the resection involved the terminal ileum an anastomosis between the ileum and ascending colon was performed on several occasions with good results.

Conclusions

No rigid conclusions can be drawn from an investigation such as this, and most of the questions remain unanswered, but the following suggestions based on the results are tentatively made.

1. Where strangulation and gangrene has been rapid with little dilatation of the bowel above the site such as occurs in some acute strangulations due to bands, a closed (aseptic) end-to-end anastomosis can be easily and safely made.

2. Where gangrene is associated with prolonged obstruction and gross dilatation of the proximal bowel an open side-to-side anastomosis is safer and more easily performed, and in these cases an additional enterostomy may be advisable.

3. Gastro-intestinal suction should be used in all cases.

BIBLIOGRAPHY

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