

Ileocolonic Anastomosis with Chromic Catgut and Polypropylene Versus Polyglactin⁹¹⁰ - A comparative study

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Forty-eight patients underwent right hemicolectomy and end to end double layer ileocolonic anastomosis. They were divided in two groups on the basis of different suture material used in the anastomosis. In group A chromic catgut 00 for inner layer and polypropylene for seromuscular layer was used. In group B both layers were stitched with polyglactin⁹¹⁰ in the same manner. The results of both groups are comparable and equally effective but chromic catgut and polypropylene sutures are about fifty percent economical than polyglactin suture used in a single ileocolonic anastomosis.

Key words: Ileocolonic anastomosis, sutures, chromic catgut, polypropylene.

Surgical sutures are an integral part of every operative procedure. The search for an ideal suture material has seized the surgeon. Since man first attempted closing the wounds. Tensile strength, lack of tissue reactivity, low cost and ease of handling and tying are desired characteristics for any suture in used. Intestinal anastomosis have clinically significant complication such as leakage and stricture formation. Different studies demonstrate that greater speed and ease of stapled anastomosis is offset by greater strength reduced intensity to stricture formation and more complete healing of hand sewn anastomosis^{1,2}

The factors which effect the out come of anastomosis are age, sepsis, malnutrition, anemia, jaundice, uremia, type and grade of malignancy and irradiation to that area. The important local factors are the site of anastomosis, proximal fecal loading, good blood supply, and tension in anastomosis and the suture material used. The experience of surgeon and technique has also a major role.

Chromic catgut is natural absorbable monofilament suture which is easy to handle and has a very low cost as compared to the polyglactin⁹¹⁰ the synthetic absorbable suture. There is no convincing evidence that the polyglactin and polyglycolic acid sutures are superior to chromic catgut suture in intestinal anastomosis³. Polypropylene is an inert nonabsorbable synthetic monofilament suture with an adequate tensile strength can be used in intestinal anastomosis⁴.

Patients and methods

This study was conducted in general surgical unit of Mayo hospital Lahore. 48 patients in whom right hemicolectomy and primary end to end ileocolonic anastomosis in double layers performed were included. In inner layer continuous and in outer layer interrupted Lambert sutures were applied. Patients were randomly divided in two groups. In group A chromic catgut 00 for inner layer and polypropylene 000 for outer layer was used. On average one complete anastomosis required one pack each of chromic catgut 00 and polypropylene 000. In group B both layers sutured with polyglactin⁹¹⁰ 000 with similar

technique and two packs of the suture used. All the surgeons were well experienced and using the same techniques in all cases. The market price of the sutures at the time of anastomosis was also recorded according to the receipts available.

Results

There were 32 (66.6%) males and 16 (33.3%) females, mean age 30 years (14-70), 36 (75%) admitted through casualty department and 12 (25%) through the OPD. The indications for right hemicolectomy and their distribution in both groups is shown in table 1

Table 1:

| Nature of Injury/Presentation | n= | Group A* | Group B** |
|-------------------------------|----|----------|-----------|
| Fire arms injury | 24 | 13 | 11 |
| Mass colon | 8 | 3 | 5 |
| Stab injury | 6 | 4 | 2 |
| Blunt trauma abdomen | 4 | 2 | 2 |
| Distal ileal stricture | 6 | 2 | 4 |
| Total | 48 | 24 | 24 |

*Group A: Anastomosis done with chromic catgut 00 and polypropylene 000 (Prolene).

**Group B: Anastomosis done with polyglactin⁹¹⁰ 000 (Vicryl).

Thirty four (70%) patients presented with perforated injury to the right colon out of which 24 were fire arms, 6 with stab and 4 with blunt trauma abdomen. Eight (16.6%) were having a mass confined to caecum and ascending colon out of them 5 proved to be tuberculous and 3 adenocarcinoma on histopathology. Six (12.5%) cases admitted with the stricture of the distal ileum due to tuberculosis. The major postoperative complication were wound sepsis in 16 (33%) cases, which were treated with wash and dressings of the wounds. six had prolonged postoperative ileus due to electrolyte imbalance. Three (6.2%) developed pelvic abscesses which were drained. There was no leakage of anastomosis in both groups. Thirty-two patients were discharged from hospital with out any complication the mean post-operative stay was 9 days. Patients followed up fortnightly for two months and monthly for the next six months. No symptoms or signs of intestinal obstruction

detected. The cost of the sutures of group A was about half the prices of the sutures used in 'Group B in a single ileocolonic anastomosis.

Discussion

It takes a long time for a new and often heretical treatment to supersede the older established practices in medicine and surgery. New forms of treatment not only must prove themselves superior to the established safe treatments but also be cheaper and cost effective.

Much of the morbidity from operations on the small intestine is caused by leakage of anastomosis. Disruption of the suture line is clinically apparent in 5% of all primary colonic anastomosis⁵ and rare in small intestine⁶. In the study there is no leakage in both groups because absolute requisites for successful anastomosis were followed such as healthy intestinal edges, good blood supply, absence of tension and accurate placement of sutures to ensure a water tight seal. A good technique is probably the most important one. A few extra minutes pay handsome dividends and may save the patients' life⁶.

The choice of the suture material is dictated by individual preference. There are different opinions about it. Some believe and suggest that polyglactin is superior to catgut for the inner layer of the conventional two-layer anastomosis⁷ but there is no convincing evidence that it is true⁸. As the type of suture does not affect the microscopic healing in the bowel so the chromic catgut is widely used for the inner layer⁹. For the outer layer with the conventional use of delayed absorbable synthetic sutures, the silk, polypropylene and fine wire has all been used⁷. There is theoretical advantage in the use of mono filament polypropylene in that it causes less tissue reaction than the braided suture but the difference in intestine appears to be relevant minor and the monofilament suture have inferior handling qualities⁸. So in the randomized selected cases we performed this study. It is relative new idea to use polypropylene on small intestine but in colonic anastomosis it has been commonly used. In a study of 440 ileocolonic anastomosis after right hemicolectomy for carcinomas show that the anastomotic leakage associated with staples (2.8%) less with all other handsewn technique (8.3%)¹⁰.

A classical study was carried out in dogs, which were sacrificed on 1,4,7, and 28 days post operatively and evaluated for anastomotic index, burst pressure, collagen content and histological appearance¹⁰. In our study on 48 patients the above mentioned classical protocol could not

be followed however patients were clinically examined for any leakage or stenosis for 9 post operative days in the ward and thereafter followed up fortnightly for two months and monthly for the next 6 months. The decreased morbidity in the study was due to relatively young healthy patients with acute problems associated with mild to moderate peritonitis. There were only three malignant cases in the study and they had a smooth recovery with out complication. Few patients had delayed bowel movements due to electrolyte imbalance but improved on restoration of that balance.

Conclusion

This study concluded that the use of a combination of chromic catgut and polypropylene has comparable and equal effective results as with polyglactin^{9,10} in intestinal anastomosis. So it is recommended that chromic catgut and polypropylene combination for double layer ileocolonic anastomosis is safe, effective and a more economical choice.

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