

Comparison of single and double layer intestinal anastomosis in Ahwaz educational hospitals (2005-2006)

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Citation

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Abstract

Backgrounds and aim: This study evaluated complications of intestinal anastomosis in urgent and elective patients with two methods: single- or double-layer anastomosis. **Patients and methods:** This case-control study was carried out from July 1, 2005 to Aug 31, 2006 (14 months) in 3 university hospitals. Patients who had an indication for intestinal anastomosis (urgent or elective) were included. In this study, 126 patients with an average age of 31.39 ± 21.08 years were divided into two groups: single-layer (63 patients) and double-layer (63 patients) intestinal anastomosis. In the single-layer group, intestinal anastomosis was carried out in continuous or interrupted method with absorbable or non-absorbable suture. Double-layer anastomosis was carried out in internal layer with continuous suture and external layer with interrupted suture. Post-operation complications were evaluated for fistula, wound infection, intra-abdominal abscess and stricture of anastomosis site. All intestinal anastomoses were carried out with the hand-sewn method. **Results:** In single-layer intestinal anastomosis, 5 patients (7.9%) had wound infection, 2 patients (3.2%) intra-abdominal abscess and one patient (1.6%) enterocutaneous fistula, and in the two-layer group, 7 patients (11.1%) had wound infection, 2 patients (3.2%) intra-abdominal abscess and 4 patients (6.3%) fistula. No patient experienced stricture of the intestinal anastomosis site. **Conclusion:** Single-layer anastomosis is safe. Complications of single- or double-layer anastomosis were similar. In addition, we have decreased operation time and total cost by the single-layer method.

BACKGROUNDS AND AIM

The basic principles of the intestinal suture were established more than 100 years ago by Travers, Lambert and Halsted ¹. Two-layer anastomosis was done by Larry in the 19th century ². Historically, two-layer anastomosis using interrupted silk sutures for an outer inverted seromuscular layer and a running absorbable suture for a transmural inner layer has been standard for most surgical situations. Some recent reports have described single-layer continuous anastomosis using monofilament sutures as requiring less time and cost than any other method, without incurring any added risk of leakage ^{3, 4, 5, 6}. The single-layer continuous anastomosis is a contemporary innovation first described by Hautefeuille in 1976 ⁷. In the USA, the first mention of this technique was by Allen et al. ⁸ Length of surgery was less in single-layer than in two-layer anastomosis and lesser trauma was caused in single-layer anastomosis. Two systematic reviews of randomized controlled trials (RCTs) comparing stapled with hand-sewn colorectal anastomosis found no difference between the two methods. ⁹ Many surgeons probably now use single-layer suturing due to reduction in ischemia, tissue necrosis, or narrowing of the lumen

compared to the two-layer methods. This study evaluated complications of intestinal anastomosis in urgent and elective patients with the two methods of single- or double-layer anastomosis.

PATIENTS AND METHODS

This case-control study was carried out from July 1st, 2005 to Aug. 31, 2006 in 3 university hospitals (Golestan, Abuzar, Imam Khomeini). One hundred and twenty-six patients who needed intestinal (large or small) anastomosis were included in this study. Patients who needed gastric, duodenum, and rectal anastomosis were excluded. These patients with average age of 31.39 ± 21.08 years were divided into two groups: single-layer and double-layer intestinal anastomosis (63 patients in each group). In the single-layer group, intestinal anastomosis was carried out in continuous or interrupted methods with absorbable or non-absorbable suture. Double-layer anastomosis was carried out in an internal layer with continuous suture and an external layer with interrupted suture. Postoperative complications were evaluated for fistulae, wound infection, intra-abdominal abscess and stricture of anastomosis site until 30 days after

surgery. All intestinal anastomoses were carried out with the hand-sewn method. Chi-square tests were used for analysis.

RESULTS

In the single-layer group, 5 patients (7.9%) had wound infection, 2 patients (3.2%) intra-abdominal abscess and one patient (1.6%) enterocutaneous fistula and in the two-layer group, 7 patients (11.1%) had wound infection, 2 patients (3.2%) intra-abdominal abscess and 4 patients (6.3%) fistulae. No patient experienced stricture of intestinal anastomosis site. The intra-abdominal abscesses were associated with minimal or no leakage.

Figure 1

Table I: Distribution of complications with two methods of anastomosis

Method of anastomosis	Intra abdominal abscess		Fistula		Wound Infection	
	%	N	%	N	%	N
Single-layer	3.2	2	1.6	1	7.9	5
Two-layer	3.2	2	6.3	4	11.1	7
P-value		0.171		1		0.554

DISCUSSION

Single layer anastomosis is safe. In this study, we found that complications of single-layer anastomosis are similar to double-layer anastomosis and this finding was similar to the study of Chittmitrapap et al. ¹⁰. Abscess formation was seen in 3.2% of cases with single-layer and two-layer anastomoses. A similar rate of abscess formation was reported by Burch et al. ¹¹ and Skakun et al. ¹². Shikata et al. reported that two-layer intestinal anastomosis offers no definite advantage over single-layer anastomosis in terms of post-operative leak. ¹³ As shown above, single-layer anastomosis may be a better choice than two-layer anastomosis. In addition, we found decreased operation time

and total cost with the single-layer method.

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