



Complications following primary anastomosis in young children

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Introduction

- The incidences of anastomotic stenosis and leakages are widely unknown following primary anastomosis.^{1,2}
- Due to the fear of these complications, an enterostomy is sometimes perceived the more “safe” option.
- Yet anastomotic leakage and stenosis do also occur following treatment by stoma.^{1,2,3}
- What is the incidence, high risk diseases and what are (technical) risk factors?

1. Eeftinck Schattenkerk LD, Musters GD, Nijssen DJ, de Jonge WJ, de Vries R, van Heurn LWE, et al. The incidence of abdominal surgical site infections after abdominal birth defects surgery in infants: A systematic review with meta-analysis. *Journal of pediatric surgery*. 2021.

2. Eeftinck Schattenkerk LD, Backes M, de Jonge WJ, van Heurn EL, Derikx JP. Treatment of Jejunoileal Atresia by primary anastomosis or Enterostomy: Double the operations, double the risk of complications(1,2,3). *Journal of pediatric surgery*. 2021.

3. Eeftinck Schattenkerk LD, Musters GD, Nijssen DJ, Jonge WJd, Vries Rd, Heurn LWEv, et al. The incidence of different forms of ileus following surgery for abdominal birth defects in infants: a systematic review with a meta-analysis method. *Innovative Surgical Sciences*. 2021.

Methods

- Retrospective cohort study
- All young children (≤ 3 years of age) undergoing primary intestinal anastomosis
- Between 1998 – 2018 in Amsterdam University hospital
- **Definitions:**
 - Anastomotic leakage: ISREC definition
 - Anastomotic stenosis: obstructive symptoms AND stenosis at sight of anastomosis observed
- Patients that died within one week were not included in anastomotic stenosis incidence
- Risk factors analyzed using cox regression (stenosis) and chi-squared statistics (leakage)

Results - Cohort

- A total of 477 patients received a primary intestinal anastomosis
- Intestinal atresia (30%), Hirschsprung's disease (29%) and necrotizing enterocolitis (14%) were most common in our cohort
- The median follow-up was 770 days (IQR: 225 – 2125)
- 12% (59/477) had a follow-up ≤ 1 year

Results – Anastomotic stenosis

- Anastomotic stenosis occurred in 8% (37/468)
- In a median of 44 days (IQR: 25 -209)
- 83% occurred within one year, 90% within two years
- Most at risk were those treated for necrotizing enterocolitis (14%, 9/65), Hirschsprung's disease (9%, 12/136) and intestinal atresia (6%, 9/142).
- Three patients (8%) died following redo-surgery

Results – Anastomotic stenosis

- **Risk factors:**
- Colon-colonic anastomosis (HR: 3.0, 95%-CI: 1.4-6.7, $p \leq 0.01$)
- *Non-significant:*
- Type of anastomosis: end-to-end ($p = 0.07$), end-to-side ($p = 0.89$)
- Suture resportion time ($p = 0.53$)
- Mode of suturing ($p = 0.23$)

Results - Anastomotic leakage

- Anastomotic leakage occurred in 5% (22/477)
- In a median of 6 days (IQR: 3-7)
- All leakages were ISREC – C (“requiring re-laparotomy”)
- Most at risk were those treated for intestinal atresia (6%) or necrotizing enterocolitis (5%)
- Two patients (9% of all leakages & 0.4% of total cohort) died due to the leakage before redo-surgery
- Redo-surgery resulted in a stoma (50%) or new anastomosis (50%)
- Both male gender ($p = 0.03$) and an ASA score $\geq$ III ($p = 0.03$) were significantly associated with anastomotic leakage.

Discussion

- The process of anastomotic healing is to a great extent unclear
- **Anastomotic Stenosis**
- Colonic anastomosis more at risk of stenosis or more prone to become symptomatic?
- None of the technical factors of creation were identified as risk factor
- A two year follow-up period seems acceptable

Discussion

- **Anastomotic leakage**
- Mortality occurred in two vulnerable patients
- Half of those that recover do so without an enterostomy
- Patient specific factors (ASA score, male sex) should direct choice of treatment rather than type of disease
- Even in high risk patients primary anastomosis should be considered

Limitations & Conclusion

- Retrospective data limited perioperative factors to be analysed
- Longer follow-up might increase stenosis incidence
- Identifying more patient specific factors can result in better selection which patients can receive a primary anastomosis which could result in less stoma's.
- These factors should not solely be based on type of disease.

Questions

