



Evaluation of Factors Affecting Outcomes in Neonates with Enterostomy

Enterostomili Yenidoğanlarda Sonuçları Etkileyen Faktörlerin Değerlendirilmesi

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Abstract

Introduction: The aim of this study is to evaluate the neonatal enterostomies performed in our clinic in the last 7 years and to identify factors affecting outcomes in neonates with enterostomy.

Material and Method: From January 2015 to September 2021, 34 newborns who underwent enterostomy procedure as part of the treatment for a variety of intestinal disorders were included in the study. Medical records were reviewed retrospectively for birth week, birth weight, gender, primary intestinal disease, type of stoma, age at stoma closure, complications and mortality.

Results: Of 34 patients, 12 were female (35.3%) and 22 were male (64.7%). The mean birth weight of the patients was 2602 ± 927 g, and the average week of birth was 36 ± 3.2 weeks. Ileostomy was performed in 14 patients (41.2%), and colostomy was performed in 20 (58.8%) patients. Hirschprung's disease was the commonest bowel anomaly ($n=13$, 38.2%) requiring enterostomy and second anomaly was anorectal malformation ($n=8$, 23.5%). Complications developed in 5 patients (14.7%); stomal prolapse in 4 and parastomal hernia in 1. A statistically significant difference was found between complications and low birth weight ($p=0.038$). Mortality developed in 5 patients (14.7%). However, mortality was significantly higher in patients with low birth week ($p=0.033$).

Conclusions: Enterostomy is usually a temporary procedure in neonates and is closed when the primary disease is corrected. Considering the complications and mortality, maximum care should be taken during and after surgery, especially in low birth weight or week-old infants who undergone enterostomy.

Keywords: Enterostomy, ileostomy, colostomy, complication

Öz

Giriş: Bu çalışmanın amacı kliniğimizde son 7 yılda yapılan yenidoğan enterostomilerini değerlendirmek ve ve enterostomili yenidoğanlarda sonuçları etkileyen faktörleri belirlemek.

Gereç ve Yöntem: Ocak 2015-Eylül 2021 tarihleri arasında, çeşitli bağırsak hastalıklarında tedavisinin bir parçası olarak enterostomi prosedürü uygulanan 34 yenidoğanın tıbbi kayıtları, doğum haftası, doğum ağırlığı, cinsiyet, birincil bağırsak hastalığı, stoma türü, stoma kapanma yaşı, komplikasyonlar ve mortalite açısından geriye dönük olarak gözden geçirildi.

Bulgular: 34 hastanın 12'si (%35,3) kadın, 22'si (%64,7) erkekti. Hastaların ortalama doğum ağırlığı 2602 ± 927 gr, ortalama doğum haftası $36 \pm 3,2$ haftaydı. 14 hastaya (%41,2) ileostomi, 20 (%58,8) hastaya kolostomi uygulandı. Hirschprung hastalığı ($n=13$, %38,2) enterostomi gerektiren en yaygın bağırsak anomalisi, ikinci anomali ise ($n=8$, %23,5) anorektal malformasyondu. 5 hastada komplikasyon gelişti (%14,7). Gelişen komplikasyon; 4 prolapsus, 1 fasya açıklığı. Doğum ağırlıkları karşılaştırıldığında komplikasyon gelişmesinde istatistiksel olarak anlamlı fark bulundu ($p=0,038$). 5 hastada (%14,7) mortalite gelişti. Doğum haftası mortalite açısından karşılaştırıldığında aralarında anlamlı fark bulundu ($p=0,033$).

Sonuç: Enterostomi genellikle yenidoğanlarda geçici bir işlemdir ve birincil hastalık düzeltildiğinde kapatılır. Komplikasyonlar ve mortalite göz önüne alındığında, özellikle enterostomi uygulanan düşük doğum ağırlıklı veya düşük doğum haftası olan bebeklerde ameliyat sırasında ve sonrasında azami özen gösterilmelidir.

Anahtar Kelimeler: Enterostomi, ileostomi, kolostomi, komplikasyon



INTRODUCTION

Enterostomy is a life-saving procedure in many congenital and acquired gastrointestinal system diseases that occur in the neonatal period. It can be applied as in emergency situations such as intestinal perforation, necrosis and obstruction.^[1-4] It can also be performed as a palliative surgery until corrective surgery is performed in some congenital anomalies such as anorectal malformations (ARMs), Hirschprung's disease (HD), cloacal exstrophy.^[1,2,5] Stoma may be necessary at any level of the gastrointestinal tract. In newborns, stomas are usually opened temporarily until the associated disease is corrected.^[6] The frequent complications associated with enterostomy formation are prolapse, retraction, stenosis or necrosis of the stoma, parastomal hernia and breakdown of the skin.^[2]

The aim of this study is to evaluate the neonatal enterostomies performed in our clinic in the last 7 years and to identify factors affecting outcomes in neonates with enterostomy.

MATERIAL AND METHOD

Ethical approval

Permission from the institutional review board was obtained before the study (IRB approval number: 19/299). Informed consent was obtained from the patients.

Study Design

The medical records of newborns (aged 0 to 28 days) who underwent enterostomy procedure in our clinic between January 2015 and September 2021 were reviewed retrospectively. The patients were analyzed for birth week, birth weight, gender, primary intestinal disease, type of stoma, age at stoma closure, complications and mortality. Three patients with missing data were excluded from the study.

Statistical Analysis

Data were analyzed using SPSS 22.0 (IBM Inc., Chicago, IL, USA). Chi-Square test was used to compare nominal variables. The odds-ratio was used in order to evaluate other data. In all analyses, $p < 0.05$ was considered as statistically significant.

RESULTS

Thirty-four patients were included in the study. Of these, 12 were female (35.3%) and 22 were male (64.7%). The mean birth weight of the patients was 2602 ± 927 g, and the average week of birth was 36 ± 3.2 weeks. Ileostomy was performed in 14 patients (41.2%), and colostomy was performed in 20 patients (58.8%). The primary intestinal diseases of the patients and the types of enterostomy according to these diseases are given in **Table 1**. The mean hospital stay of the patients was 33 ± 38 days. After the primary bowel disease was corrected, the enterostomy of 24 patients was closed. The mean age at closure of enterostomies was 13 ± 8 months.

Table 1. primary disease and enterostomy type in patients

Primary disease	n	%	ileostomy	colostomy
ARM*	8	23.5	0	8
Hirschprung's Disease	13	38.2	4	9
Intestinal Atresia	3	8.8	3	0
Perforation	5	14.7	4	1
NEC#	2	5.9	1	1
Other	3	8.8	2	1
Total	34	100	14	20

ARM= Anorectal Malformation, NEC=Necrotizan Enterocolitis

Complications developed in 5 patients (14.7%); Stomal prolapse in 4 and parastomal hernia in 1 (**Table 2**). While the mean birth weight was 1726 ± 985 g in patients with complications, it was 2753 ± 845 g without complications. The birth weights of the patients with complications were significantly lower than those without complications ($p = 0.038$). The week of delivery was 33.8 ± 4.8 weeks in patients with complications, while it was 36.3 ± 2.7 weeks in patients without complications. There was no significant difference between the week of delivery and complications ($p = 0.295$).

Table 2. Characteristics of neonates with complications

Complication	Type of Stoma	Birth Weight	Birth Week	Primary Disease
Prolapse	Ileostomy	1150 g	29 week	Perforation
Prolapse	Ileostomy	2680 g	38 week	HD*
Prolapse	Ileostomy	900 g	28 week	HD*
Prolapse	Colostomy	2940 g	37 week	ARM#
Parastomal Hernia	Ileostomy	990 g	36 week	Intestinal Atresia

HD= Hirschprung's Disease, ARM= Anorectal Malformation

Mortality developed in 5 patients (14.7%) (**Table 3**). While the birth weight was 2239 ± 777 g in patients with mortality, it was 2665 ± 948 g in surviving patients. Birth weight of the patients was not associated with mortality ($p = 0.477$). The mean week of delivery was 33.8 ± 2.6 in patients with mortality, while it was 36.3 ± 3.1 in surviving patients. Mortality was significantly higher in patients with low birth week ($p = 0.033$).

Table 3. Characteristics of patients with mortality

Mortality	Type of Stoma	Birth Weight	Birth Week	Primary Disease
1	Ileostomy	29	1150	Perforation
2	Colostomy	35	2750	Other
3	Ileostomy	35	2850	Perforation
4	Ileostomy	35	1675	HD*
5	Ileostomy	35	2770	Ileal Atresia

HD= Hirschprung's Disease

DISCUSSION

Although some forms of enterostomy have been performed throughout history, Littre examined a 6-day-old dead infant with ARM in 1710 and reported that enterostomy could be lifesaving.^[7] Over the next 75 years, Duret and Freer performed the colostomy procedure in infants with ARM.^[7]

Enterostomy is performed in the neonatal period as a life-saving procedure in emergencies or as elective surgery to protect the gastrointestinal tract until existing congenital anomaly is corrected.^[3,8] Enterostomies can be performed at any level of the gastrointestinal tract in neonatal period depending on the clinical condition and primary disease of the patient.

In our study, the two most common intestinal anomalies requiring enterostomy were HD (38.2%) and ARM (23.5%), respectively. This finding is similar to other studies in the literature.^[8] Although it is stated in the literature that enterostomy is frequently performed in patients with necrotizing enterocolitis (NEC), it was applied to only 2 patients in our study.^[2,4]

The frequent complications associated with enterostomy formation are prolapse, retraction, stenosis or necrosis of the stoma, parastomal hernia and breakdown of the skin.^[2] After enterostomy closure, complications such as anastomotic leakage and bowel obstruction may occur.^[2] The overall of our complication rate is 14.7% following enterostomy procedure; it is lower than the complication rate reported as 32-80.5% in literature.^[2,8] The complication rates for colostomy in infants have been well documented by Mollitt et al.^[6] including a 12% rate of prolapse and a 6% rate of stenosis. Reported complication rates are as high as 68% in neonates with NEC.^[2] We think that the reason for our low complication rates is due to the low number of patients with NEC. Because Wolf et al.^[2] showed that patients with NEC are more prone to enterostomy complications.

Complications were significantly higher in children with low birth weight in our study, and the most common complication was stomal prolapse. Parastoma hernia developed in only one patient weighting less than 1000 g and having an ileostomy. We think that this is due to insufficient development of the abdominal wall and fascia in low-weight babies. Of the 5 patients who developed complications, 4 had ileostomy. This result suggests that complications are more common in patients with ileostomy. Enterostomy was closed in 70.5% of patients after treatment of the primary disease was completed. Our mortality rate was 14.7% and mortality was significantly higher in premature babies. None of the deaths were due to enterostomy and its complications. Although this study presented some important findings related to neonatal enterostomies, the low number of patients is a great limitation of this study.

CONCLUSION

Although enterostomy is a life-saving procedure in newborns, some complications may occur after the procedure. The most common complication is stomal prolapse, and it is more common in low-birth-weight babies with an ileostomy. Mortality due to primary enterostomy is very rare, and it is mostly associated with low gestational age.

ETHICAL DECLARATIONS

Ethics Committee Approval: This article was approved by the Ethics Committee of Süleyman Demirel University, Faculty of Medicine, numbered 19/299.

Informed Consent: Because the study was designed retrospectively, no written informed consent form was obtained from patients.

Referee Evaluation Process: Externally peer-reviewed.

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