Evaluation of Nissen Fundoplication Patiens: Single Center Experience

Nissen Fundoplikasyonu Yapılan Olguların Değerlendirilmesi: Tek Merkez Deneyimi

Gokhan DEMIRTAS[1], Suleyman BOSTANCI[2], Mujdem Nur AZILI[2], Fatih AKBIYIK[2], Emrah SENEL[2], H. Tugrul TIRYAKI[1]

[1] Ankara City Hospital, Children's Hospital, Department of Pediatric Urology, Ankara, Turkey
[2] Ankara City Hospital, Children's Hospital, Pediatric Surgery Department, Ankara, Turkey

ABSTRACT

Objective: Gastroesophageal reflux (GERD) disease is one of the most common diseases in western society. The fate of the fundoplication procedure, especially in patients with neurological problems, is still controversial. With the introduction of laparoscopic fundoplication application in the last two decades, significant advances have been made in surgical interventions. In this study, we aimed to compare the postoperative complications in patients with and without neurological problems with whom we performed open and laparoscopic Nissen fundoplication.

Material and Methods: The aim of this study is to present laparoscopic and open Nissen fundoplication cases performed for GERD in our clinic between 2009-2014 and compare the complications.

Results: 29 female and 35 male patients aged between 5 days -18 years (mean 7.06 +/- 5.16) were included in the evaluation. There were neurological problems in 38 of them were accompanied by neurological problems. laparoscopic surgery was performed to 14 cases and open surgery was preferred for 50 cases. In the postoperative period, while there were no complications in 31 patients, 11 cases had wound infection, 9 cases had pulmoner infection, 9 cases were vomiting, 1 case had hemopneumothorax, 1 case had a gastric perforation.

Conclusion: The prevalence of pulmonary problems in the preoperative period, increases the morbidity of the surgical intervention to be made. The most important factor affecting morbidity in such patients, after minimizing preoperative pulmonary problems.

Key Words: Cerebral palsy, Gastrooesophageal reflux disease, Nissen fundoplication

ÖZ

Amaç: Gastroözofageal reflü hastalığı çocukluk yaş grubunda sık görülen hastalıklardan biridir. Özellikle nörolojik sorunları olan olgularda uygulanan fundoplikasyon işleminin akibeti hala tartışmalıdır. Son iki dekatta laparoskopik fundoplikasyon uygulamasının rutine girmesi ile cerrahi girişimlerde önemli ilerlemeler sağlanmıştır. Bu çalışmada biz açık ve laparoskopik Nissen fundoplikasyonu yaptığımız nörolojik problemi olan ve olmayanlarda postoperatif dönemdeki komplikasyonları karşılaştırmayı hedefledik.

Gereç ve Yöntemler: Bu çalışmada kliniğimizde 2009-2014 yılları arasında gerçekleştirilen açık ve laparoskopik Nissen operasyonları ve sonrasında gelişen komplikasyonları retrospektif olarak incelenmiştir.

Bulgular: Değerlendirmeye 5 gün-18 yaş arası 29 kız ve 35 erkek hasta dahil edildi. Olguların 38'inde nörolojik problem mevcuttu. 14 olguya laparoskopik cerrahi, 50 olguya açık cerrahi tercih edildi. Postoperatif dönemde 31 hastada

DEMIRTAS G : 0000-0003-0787-2330
BOSTANCI S : 0000-0002-7512-3895
AZILI MN : 0000-0002-5137-7209
AKBIYIK F : 0000-0002-2194-5041
SENEL E : 0000-0002-0383-4559
TIRYAKI HT : 0000-0002-9544-1137

Conflict of Interest / *Çıkar Çatışması*: On behalf of all authors, the corresponding author states that there is no conflict of interest.

Ethics Committee Approval / *Etik Kurul Onayı*: 2019-215 approval was obtained from the Ankara Child Health and Diseases Hematology Oncology Training and Research Hospital Clinical Research Ethics Committee for the research.

Contribution of the Authors / Yazarların katkısı*: *DEMIRTAS G: Planning methodology to reach the Conclusions, Taking responsibility in patient follow-up, collection of relevant biological materials, data management and reporting, execution of the experiments, Taking responsibility in logical interpretation and conclusion of the results, ***BOSTANCI S:*** Taking responsibility in patient follow-up, collection of relevant biological materials, data management and reporting, execution of the experiments, ***AZILI MN:*** Reviewing the article before submission scientifically besides spelling and grammar, Taking responsibility in logical interpretation and conclusion of the results. ***AKBIYIK F:*** Taking responsibility in logical interpretation and conclusion of the results, Reviewing the article before submission scientifically besides spelling and grammar. ***SENEL E:*** Taking responsibility in logical interpretation and conclusion of the results, Reviewing the article before submission scientifically besides spelling and grammar. ***TIRYAKI HT:*** Constructing the hypothesis or idea of research and/or article, Organizing, supervising the course of progress and taking the responsibility of the research/study, Reviewing the article before submission scientifically besides spelling and grammar.

How to cite / *Atıf yazım şekli* : Demirtas G, Bostanci S, Azili MN, Akbiyik F, Senel E Tiryaki HT. Evaluation of 64 Patients With Nissen Fundoplication. Turkish J Pediatr Dis 2020;14:413-416.

Correspondence Address / Yazışma Adresi:
Gokhan DEMIRTAS
Ankara City Hospital, Children's Hospital,
Department of Pediatric Urology, Ankara, Turkey
E-posta: drgokhandemirtas@gmail.com

Received / Geliş tarihi : 20.05.2020
Accepted / Kabul tarihi : 07.07.2020
Online published : 16.09.2020
Elektronik yayın tarihi
DOI: 10.12956/tchd.737331

komplikasyon görülmezken 11 hastada yara enfeksiyonu, 9 hastada akciğer enfeksiyonu, 9 hastada kusma, 1 hastada hemopnömotoraks, 1 hastada mide perforasyonu gelişti. Postoperatif komplikasyona göre nörolojik problemleri olan ve olmayan hastalarımız arasında istatistiksel olarak anlamlı fark yoktu. Hiçbir hastada reflü nüksü veya hiatal herni gelişmedi. Çalışmamızda hastalarımız ortalama 20.43 +/- 13.34 gün arasında 4 gün ile 87 gün arasında hastanede kalmıştır. Laparoskopik ve açık Nissen operasyonu olan olgularda, hastane yatış süresi açısından bir fark yoktu.

Sonuç: Sonuç olarak, laparoskopik ve açık fundoplikasyon olguları arasında hastaneye yatış ve komplikasyon oranları arasında fark yoktu. Ameliyat öncesi dönemde pnomoni varlığı, yapılacak cerrahi müdahalenin morbiditesini arttırmaktadır. Preoperatif akciğer problemlerini en aza indirdikten sonra operasyon planlanması bu hastalarda morbiditeyi azaltan en önemli faktördür.

Anahtar Sözcükler: Serebral palsi, Gastroözofageal reflü hastalığı, Nissen fundoplikasyonu

INTRODUCTION

Gastroesophageal reflux disease is a common entity in the childhood age group (7% to 20%) (1, 2). Nissen introduced a 360-degree fundoplication method in GERD in 1956, and although it has been described various fundoplication methods since then, it has become the most accepted method for GERD treatment (3). In the surgical treatment of GER patients, whether the patient has a neurological problem and whether a gastrostomy is required are the factors affecting the results of the procedure. In recent years, laparoscopic Nissen operation has emerged as the first choice in children for surgical treatment of gastroesophageal reflux. Even though antireflux procedures are the most common, complication rates are especially high in children with neurological problems (4, 5).

The number of studies comparing laparoscopic and open Nissen fundoplication interventions in children is relatively insufficient (6). The aim of our study was to compare the complications of laparoscopic and open Nissen fundoplication with gastroesophageal reflux in our clinic between 2009-2014.

MATERIAL and METHODS

Between 2009 and 2014, 64 patients undergoing gastroesophageal reflux Nissen operation were evaluated retrospectively from hospital records. Results were recorded according to age, gender, diseases associated with gastroesophageal reflux, surgical technique (open or laparoscopic), presence of gastrostomy and complications. All surgeries were performed by one of seven pediatric surgeons or under their management. The surgical technique (such as open or laparoscopic) is left to the surgeon's choice. In the open method, laparotomy was performed with an upper abdominal incision. A crural correction was performed using 2-0 silk suture in all patients. Fundus was sewn with 4-0 silk sutures, making a 360-degree wrap. Laparoscopic fundoplication was performed with 4 trocars of 5 or 10 mm in diameter. After the fundus portion of the stomach was released, a wrap was created in the food tube-stomach joint by wrapping around the food tube. When necessary, Stamm type gastrostomy was added to the end of the Nissen procedure.

Complications, concomitant diseases, surgical techniques, presence of gastrostomy were assessed statistically. p value smaller than 0.05 was considered statistically significant.

The records were digitized by the authors of the article and analyzed using the SPSS program. 2019-215 approval was obtained from the Ankara Child Health and Diseases Hematology Oncology Training and Research Hospital Clinical Research Ethics Committee for the research.

RESULT

Twenty-nine female and 35 male patients aged between 5 days and 18 years (mean 7.06 ± 5.16 years) were included in the evaluation. In the pre-operative period, all patients (n = 64) underwent contrast-enhanced computed tomography (CT) with a 24-hour pH monitoring, and esophagus and stomach anatomy were evaluated by upper gastrointestinal series.

There were no neurological problems in 26 of the cases while 38 of them were accompanied by neurological problems. Laparoscopic surgery was performed to 14 cases and open surgery was preferred for 50 cases. In one patient, the surgery began with laparoscopic technique but due to technical difficulties after beginning, open surgery was performed. In 40 cases, patients with gastrostomy were treated with Nissen. In the postoperative period, while there were no complications in 31 patients, 11 cases had wound infection, 9 cases had

Table I : Demographic datas of patients.

Age (years)	7.06±5.16
Sex (n%)	
Male	35
Female	39
Neurogolical problems	38 (59.5)
Operation type	
Laparoscopic	14 (21.9)
Open	50 (88.1)
Gastrostomy n(%)	40 (63.5)
Complication	
With gastrostomy (n=40)	10 (25)
without gastrostomy(n=24)	9 (3.75)

pulmoner infection, 9 cases were vomiting, 1 case had hemopneumothorax, 1 case had a gastric perforation, one patient had an incisional hernia while one patient died on a postoperative day 4. One case was reopened with the reason that wrap was squeezed too much. While there were no complications in 30 of the 40 patients with gastrostomy, some complications were seen requiring leakage and revision in 10 patients (Table I).

There was no difference in postoperative complication rates between patients with and without gastrostomy (p = 0.423, student t-test). Of the 38 patients with neurological problems, 24 had no postoperative complications and 14 had complications. Postoperative complications were not observed in 16 of 26 patients without neurological problems, but complications were observed in 10 cases. There is no statistical difference between neurological patients and non-neurological patients according to postoperative complication (p = 0.439, student t-test). Our patients were hospitalized between 4 days and 87 days with a mean of 20.43 +/- 13.34 days. In cases with laparoscopic and open Nissen operations, there was no difference in the length of hospital stay. There was no statistically significant difference in complication rates between the laparoscopic and open surgery cases (p = 0.362, student t-test). In the follow-up, we did not operate a case for the reason of recurrent GER or a hiatal hernia.

DISCUSSION

There is a consensus that laparoscopic method is preferred in the surgical treatment of GERD due to reasons such as less postoperative pain, rapid recovery, shorter hospital stay, and better cosmetic appearance (7-9). Laparoscopic fundoplication was first described in children in 1993 (10,11). Over time, less invasive approaches have become preferred in childhood (8).

Nissen operations with gastroesophageal reflux have high morbidity and mortality, especially in children with neurological problems (2,12,13). There was no statistically significant difference between our neurologic patients and non-neurological patients according to postoperative complication (p = 0.439, student t-test). Especially excessive recurrence in the hiatus dissection, and recurrent hiatal hernia results in reoperation exceeding 30% (12). In our clinic, reoperation has been performed due to squeezing wrap. No patient has been re-operated with reflux recurrence or the cause of a hiatal hernia. We think that this complication, which is less common than the literature, depends on whether keeping the hiatal dissection at a minimal level. Open or laparoscopic surgery does not affect morbidity, but surgical intervention is easier and postoperative care is facilitated by laparoscopic procedures. Laparoscopic operations have no superiority in terms of mortality or morbidity compared to open ones, but the duration of hospital stay is significantly shorter in laparoscopic structures (14). When long term results were examined, there was no significant difference between open or laparoscopic cases except subjective criteria (13). In our study, our patients stayed in the hospital between 4 days and 87 days in average 20.43 +/- 13.34 days. In cases with laparoscopic and open Nissen operations, there was no difference in the length of hospital stay. It was observed that hospitilization period of our cases were due to lung problems. There was no statistically significant difference in complication rates between the laparoscopic and open surgery cases (p = 0.362, student t test).

In many of these patients, performing gastrostomy also brings additional problems (15). While high complication rates were observed in gastrostomy Nissen in the study performed by Kubiak R and colleagues, no significant difference was observed between the complications developed in our study with gastrostomy or without gastrostomy. At the post-operative period, vomiting or increased gastric residual volume shows us that gastrostomy disrupts gastric discharge. The incidence of postoperative complications has increased in patients with gastrostomy; however, these complications have disappeared after appropriate wound care. There was no difference in postoperative complication rates between patients with and without gastrostomy (p = 0.423, student t test).

CONCLUSION

As a result, there was no difference between hospitalization and complication rates between laparoscopic and open fundoplication cases. The prevalence of pulmonary problems in the preoperative period, increases the morbidity of the surgical intervention to be made. The most important factor affecting morbidity in such patients, after minimizing preoperative pulmonary problems.

REFERENCES

1. Mauritz FA, Herwaarden Lindeboom MYA, Stomp W, Zwaveling S, Fischer K, Houwen RHJ, et al. The effects and efficacy of antireflux surgery in children with gastroesophageal reflux disease: a systematic review. J Gastrointest Surg 2011;15: 1872-8.
2. Slater BJ, SS Rothenberg. Gastroesophageal reflux. Semin Pediatr Surg 2017; 26:56-60.
3. Esposito C, Montupet Ph, Zee DD, Paye Jaouen AP, Bax NKM. Long-term outcome of laparoscopic Nissen, Toupet, and Thal antireflux procedures for neurologically normal children with gastroesophageal reflux disease. Surg Endosc 2006;20: 855-8.
4. Smith CD, Othersen HB, Gogan NJ,Walker JD. Nissen fundoplication in children with profound neurologic disability. High risks and unmet goals. Ann Surg 1992;215: 654-8.
5. Wheatley MJ, AG Coran, JR Wesley. Efficacy of the Nissen fundoplication in the management of gastroesophageal reflux following esophageal atresia repair. J Pediatr Surg 1993;28:53-5.

6. Franzen, T, Anderberg B, Wiren M, Johansson KE. Long-term outcome is worse after laparoscopic than after conventional Nissen fundoplication. Scand J Gastroenterol 2005;40:1261-8.
7. Barsness KA, Feliz A, Potoka DA, Gaines BA, Upperman JS, Kane TD. Laparoscopic versus open Nissen fundoplication in infants after neonatal laparotomy. JSLS 2007;11:461-5.
8. Rothenberg, SS. Experience with 220 consecutive laparoscopic Nissen fundoplications in infants and children. J Pediatr Surg 1998;33:274-8.
9. Siddiqui MR, Abdulaal Y, Nisar A, Ali H, Hasan F. A meta-analysis of outcomes after open and laparoscopic Nissen's fundoplication for gastro-oesophageal reflux disease in children. Pediatr Surg Int 2011;27:359-66.
10. 1Georgeson KE. Laparoscopic gastrostomy and fundoplication. Pediatr Ann 1993;22:675-7.
11. Lobe TE, KP Schropp, K Lunsford. Laparoscopic Nissen fundoplication in childhood. J Pediatr Surg 1993;28:358-60.
12. Garvey EM, Ostlie DJ. Hiatal and paraesophageal hernia repair in pediatric patients. Semin Pediatr Surg 2017; 26:61-6.
13. Jancelewicz T, Lopez M, Downard C, Islam S, Baird R, Rangel SJ, et al. Surgical management of gastroesophageal reflux disease (GERD) in children: A systematic review. J Pediatr Surg 2017;52:1228-38.
14. Salminen PT, Hiekkanen H, Rantala APT, Ovaska JT. Comparison of long-term outcome of laparoscopic and conventional nissen fundoplication: a prospective randomized study with an 11-year follow-up. Ann Surg 2007;246:201-6.
15. Kubiak R, Andrews J, Grant HW. Laparoscopic Nissen fundoplication versus Thal fundoplication in children: comparison of short-term outcomes. J Laparoendosc Adv Surg Tech A 2010; 20:665-9.