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A Review Article of Percentage of Mucosal Perforation in Open and Laparoscopic Pyloromyotomy

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Abstract **Original Research Article**

Background: With the advancement of the minimal invasive surgery it is not well determined yet the superiority of laparoscopic pyloromyotomy (LP) to open pyloromyotomy (OP) regarding the risk of mucosal perforation in particular. ***Methods:*** Retrospective single center study of all pyloromyotomies (2010-2018). The effect of laparoscopy on the procedure-related complications and mucosal perforation was determined and compared to other centers. ***Results:*** Data relating to 120 pyloromyotomies were analyzed during 108 months. There were two cases of mucosal perforation in the open group (3%) and non in the laparoscopic group (0%). ***Conclusions:*** In our series of pyloromyotomy. Both Open and Laparoscopic Pyloromyotomy are relatively associated with low rates of complications. Never the less we conclude in specialized centers, the laparoscopic approach mucosal perforation has a lower rate.

Keywords: Pyloric stenosis, pyloromyotomy, laparoscopic, and mucosal perforation.

INTRODUCTION

Hypertrophic pyloric stenosis (HPS) is one of the commonest surgical conditions pathologies in infant [1, 2]. HPS more common in boys than girls with a male to female ratio of (4:1) and has 1.8 per 1000 births prevalence rate in the United States [3]. Extramucosal longitudinal pyloromyotomy has been the standard treatment of this condition for more than hundred years [9]. After which Laparoscopic Pyloromyotomy (LP), first described in 1990, has become new popular method for the last decade with the revolution of minimal invasive surgery advancement in pediatrics and small infants. Currently, it is debatable whether (LP) is superior to open pyloromyotomy (OP) between the pediatric surgeons over the world [6].

A meta-analysis of 5 retrospective and 3 small prospective studies by done Hall et al in 2004 couldn't show clear benefit or evidence of LP over OP. Afterward; many prospective randomized controlled trials comparing LP and OP in infants with pyloric stenosis have been reported [8]. But because of the low complications rate in both approaches the open and the laparoscopic pyloromyotomy, individual trials were of limited value to detect a difference between the two. Therefore, we examined the publications with a systemic review and used the statistics on our available data to compare complication rates and outcomes between LP and OP to know the superior approach for this condition [4, 5].

METHODS

A retrospective study performed at our Hospital (Queen Rania Hospital for Children) between 2010 and 2018 showed that about 120 cases were performed; information regarding the postoperative complications most importantly mucosal perforation was analyzed.

The patients' medical records who underwent pyloromyotomy for HPS over 108 months' time at our hospital were retrospectively reviewed. Information obtained age, sex, operative time, intraoperative complication and conversion rate. Mucosal perforation and duodenal injury were considered as intraoperative complications. The incidence of mucosal perforation with the open approach in our series is 3% and is comparable to the generally reported incidence. The

incidence of mucosal perforation in the laparoscopic group was significantly lower than the open group with no single perforation (0%). This is probably due to better and magnified visualization of the laparoscopy [7].

We did analysis of our data mainly to demonstrate whether LP carries a lower or higher complications rate namely mucosal perforation in comparison to OP.

RESULTS

Among the 120 cases performed at our Hospital over 8 years, 65 cases in the Open group and 55 cases were in the Laparoscopic group. Mucosal perforation occurred in 2 open cases (3%) and none (0%) in Laparoscopic technique.

There were no exclusion criteria in our review. But OP and LP groups were directly compared in the analysis in retrospective fashion. For the OP group the mean age was 3.2months in the LP was 3.3moths, the male to female ratio was 3.5:1 in both groups, the mean operative time was 30 minutes in OP group and 42 minutes in the LP group and there was no conversion in the LP. All patients were kept fasting overnight then started to be fed gradually as tolerated

Mucosal perforation occurred infrequently in 2 patients (3%) in the OP group were recognized intraoperatively and repaired.

Regarding the studies in UK, USA, Canada, 2734 pyloromyotomies performed; 1257 were done by open approach and 1477 done laparoscopic approach. The distribution of mucosal perforation among centers is shown in table below.

Hospital	**Percentage of Mucosal Perforation in Open vs Laparoscopic Pyloromyotomy**				
	Total	**Open**	**Laparoscopic**	**% of Mucosal Perforation**	
				Open	**Laparoscopic**
Riley Hospital for Children, Indianapolis USA	350	265	85	0.4%	1.2%
Children's Mercy Hospital, Kansas City USA	502	449	53	0.2%	0%
Cincinnati Children's Hospital Medical Center, USA	179	2	177	0%	0.6%
Hospital for Sick Children and University of Toronto, Canada	373	118	255	0.8%	1.6%
Hospital Sainte-Justine, Montreal, Canada	108	15	93	0%	4.3%
Royal Hospital for Sick Children, Edinburgh, UK	171	4	167	0%	0.6%
Hall et al, USA	180	93	87	0.9%	1.3%
Birmingham, Alabama, USA	457	225	232	3.6%	0.4%
Great Ormond Street Hospital for Children, London, UK	414	86	328	0%	0.6%
Queen Rania Hospital for Children, Amman, Jordan	120	65	55	3%	0%

DISCUSSION

For the last decade there is a lot of debate and conflicting result s in retrospective and prospective data if the LP is associated with increased rate of mucosal perforation. Several series showed a higher rate in the LP approach and others showed similar result with the OP approach. Our retrospective analysis showed a significant lower incidence of mucosal perforation and zero conversion rate as well.

CONCLUSION

Laparoscopic Pyloromyotomy can be performed safely with a bit longer of operative time with less rates of mucosal perforation when done in a specialized pediatric surgery center. Never the less the superior cosmesis of the minimal invasive surgery.

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