

# Laparoscopic Vs Open Pyloromyotomy for Infantile Hypertrophic Pyloric Stenosis: A Retrospective Study

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**Abstract:** ***Background:** The gold standard procedure for treatment of infantile hypertrophic pyloric stenosis is Open Pyloromyotomy. The objective of this study was to compare the results of Laparoscopic Pyloromyotomy with the open procedure by means of a retrospective study of cases operated by both surgical techniques. **Methods:** A comparative study of cases operated by laparoscopic extramucosal pyloromyotomies (LP) between 2011-2016 was done with open pyloromyotomies (OP) performed during the same period with regard to gender, age at operation, electrolyte levels, thickness and length of hypertrophied pyloric muscle, operating time, number of days to start feeds, time of return to full feeding, frequency of postoperative emesis, surgical complications (i.e., incomplete pyloromyotomy, perforation, and need for reoperation) and duration of stay in hospital. Eighty cases (44 open, 36 LP) which fulfilled the inclusion criteria were analyzed in the study. **Results:** The groups were matched for gender more common in male child (78 %), mean age at time of surgery was 6 weeks, and 25% had severe electrolyte imbalance requiring correction. Mean size of the hypertrophied pylorus assessed by ultrasonography was 4.8mm thickness, Length 21.5mm. Mean operating time for Laparoscopic surgeries compared to open procedure didn't have a significant difference (42min: 40min). Average time for first feeds after surgery (8.5 hrs: 18.5hrs) and time for full feeding (30hrs: 64hrs) was significantly shorter in the LP group than the OP group. Post-operative emesis was seen in 80% of cases operated by Laparoscopic procedure compared to 40% in open cases. The mean length of hospitalization was significantly shorter in LP group (5days: 8days). One death was noted in a case operated by laparoscopic approach and one case operated by Laparoscopy had wound site infection near the Umbilical port. **Conclusion:** When compared with open pyloromyotomy, the laparoscopic approach appears to be equally safe and effective, with shorter time to start feeds, reach full feeds, shorter hospital stay and with superior cosmetic results. The authors believe that laparoscopic pyloromyotomy is an equally good alternative procedure for the management of hypertrophic pyloric stenosis.*

**Keywords:** Infantile, Laparoscopic, Complications, Pyloric, Retrospective

## 1. Introduction

Hypertrophic pyloric stenosis (HPS) is a common problem with the incidence of HPS being approximately 1–3 per 1,000 live births [1]. HPS is seen more common in males, with a male-to-female ratio of 4:1 [2]. The gold standard treatment of choice has been the longitudinal splitting of the seromuscular layer of the pylorus defined as “pyloromyotomy.” The constriction is relieved and this allows normal passage of stomach contents into the duodenum. The operation traditionally has been performed through a classical right-upper-quadrant (RUQ) transverse incision which provides an excellent exposure of the pylorus but results in an abdominal scar that grows with the patient and becomes quite significant with time.

Several other approaches have been introduced, such as that described by Tan and Bianchi [3] in which the pyloromyotomy is performed through a supraumbilical skin fold incision. This technique achieves an excellent cosmetic outcome with an apparently unscarred abdomen. Alain et al. [4] introduced the laparoscopic approach in 1991. The potential advantages of the laparoscopic pyloromyotomy (LP) are shorter hospital stay, improved cosmesis, shorter postoperative recovery, lower complication rates, and less postoperative pain [4–13]. These studies had different

primary outcomes and subsequently reported advantages in favor of LP.

Open Pyloromyotomy is a gold standard procedure in the management of infantile hypertrophic pyloric stenosis across the world. It is being widely accepted and performed with minimal morbidity and mortality. The paediatric minimally invasive surgery is gaining popularity among surgeons and general population. The objective of this retrospective study is to compare the results of Laparoscopic Pyloromyotomy with the open procedure.

## 2. Materials and Methods

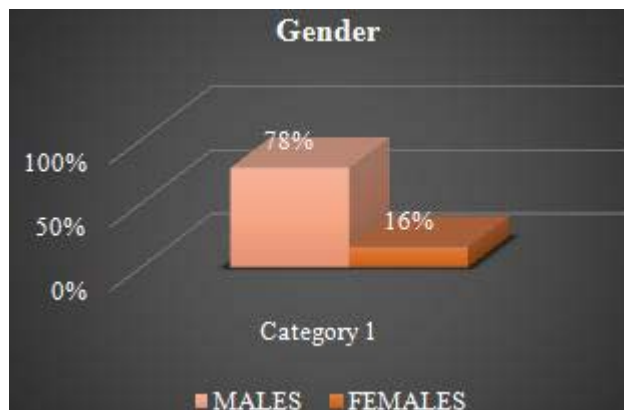
A comparative study of cases operated in Bapuji child health Institute, Davangere by laparoscopic extramucosal pyloromyotomies (LP) between 2011-2016 was done with open pyloromyotomies (OP) performed during the same period with regard to gender, age at operation, electrolyte levels, thickness and length of hypertrophied pyloric muscle, operating time, number of days to start feeds, time of return to full feeding, frequency of postoperative emesis, surgical complications (i.e., incomplete pyloromyotomy, perforation, and need for reoperation) and duration of stay in hospital. Eighty cases (44 open, 36 LP) which fulfilled the inclusion criteria were analyzed in the study.

### 3. Observations

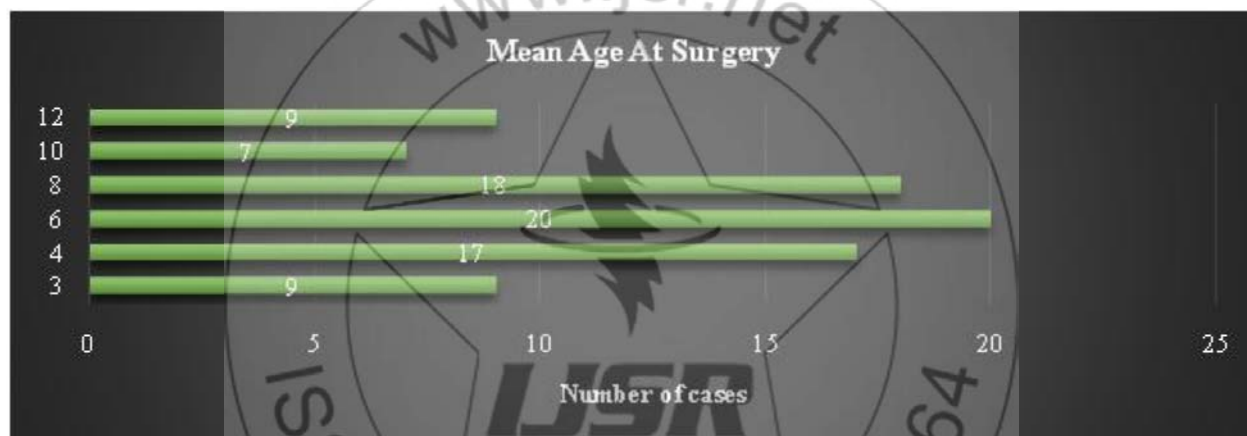
The groups were matched for,

- 1) Gender :more common in male child compared to the female child.

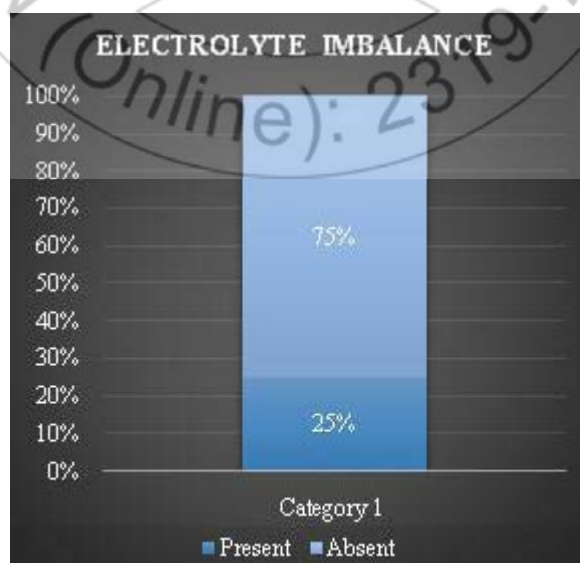
M:F = 3.75 : 1



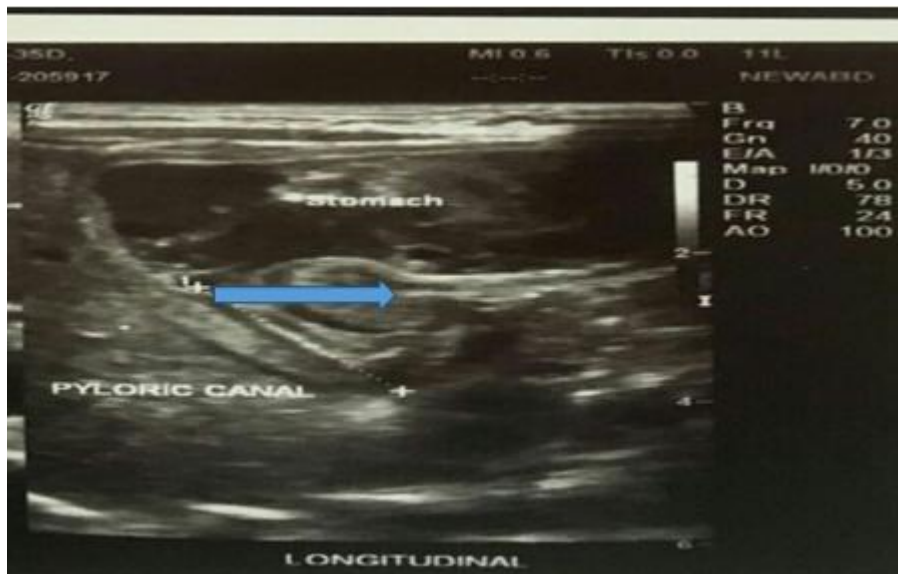
- 2) Mean age at time of surgery was 6 weeks (Range 3-12 weeks)



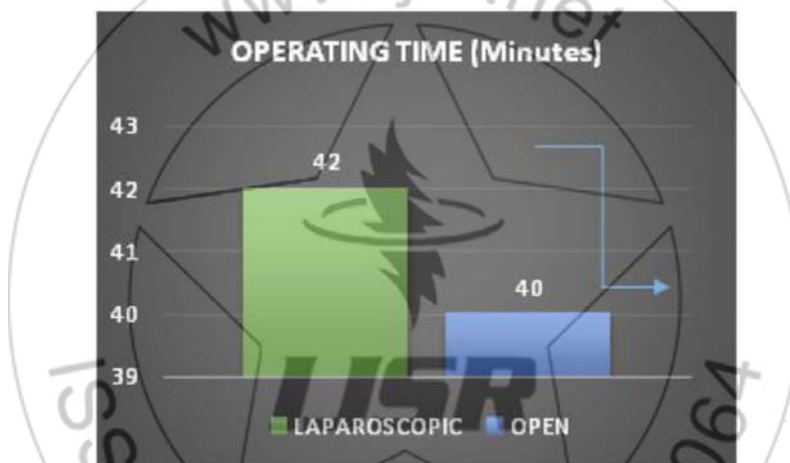
- 3) 25% had severe electrolyte imbalance requiring correction.



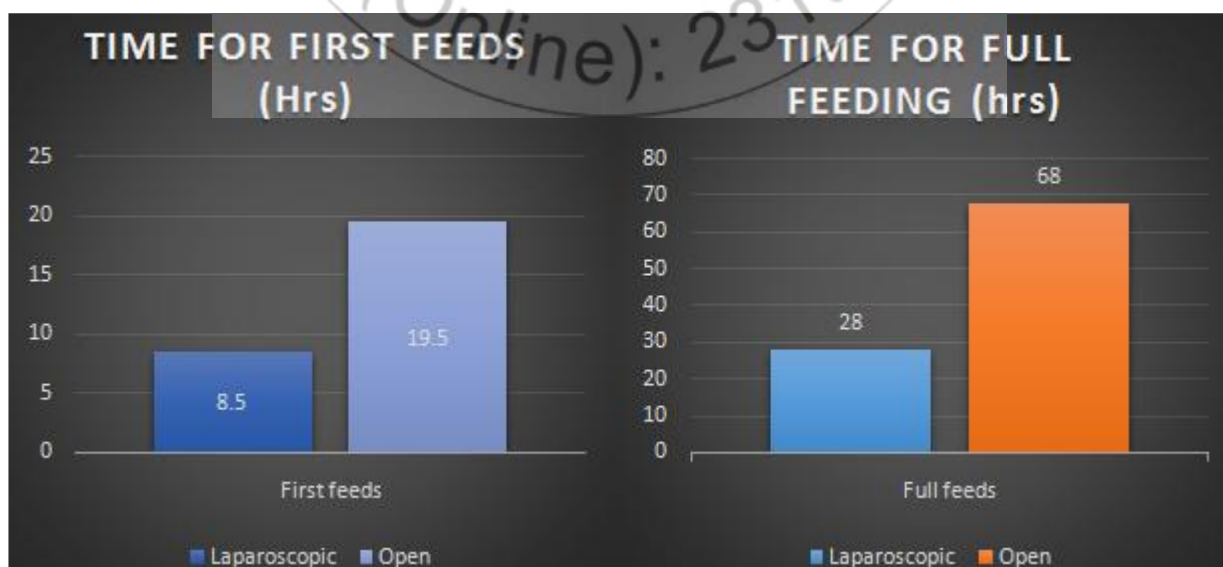
- 4) Mean size of the hypertrophied pylorus assessed by ultrasonography was 4.8mm thickness, Length 21.5mm.



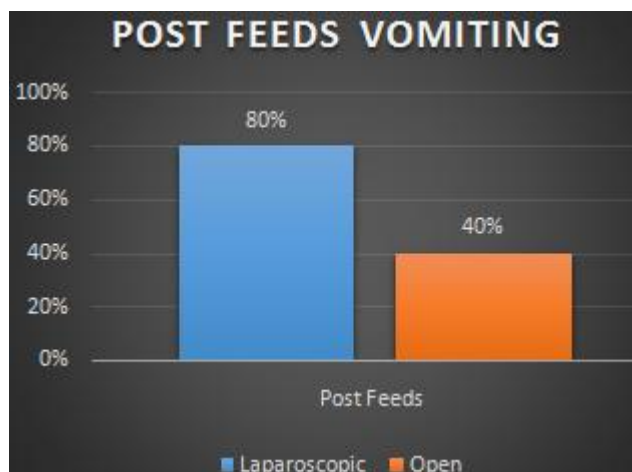
5) Mean operating time for Laparoscopic surgeries compared to open procedure had no significant difference (42min: 40min)  
P value – ( $>0.01$ ) – Using T test Paired



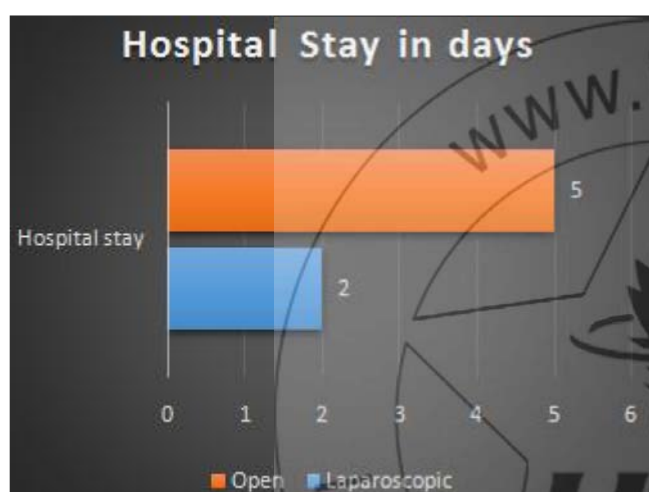
6) Average time taken for first feeds after surgery (8.5 hrs: 19.5hrs) and time for full feeding (28hrs: 68hrs) was significantly shorter in the LP group than the open group.(P value -  $<0.001$ )



7) Post-operative emesis was seen in 80% of cases operated by Laparoscopic procedure compared to 40% in open cases.



8) The mean length of hospitalization post-operative, was shorter in LP group (2days: 5days).



9) One case operated by Laparoscopy had wound site infection near the Umbilical port. One death was noted with laparoscopic approach.



#### 4. Discussion

The groups were matched for gender more common in male child (78 %), mean age at time of surgery was 6 weeks, and 25% had severe electrolyte imbalance requiring correction. Correction was done using initial bolus of 10ml/kg normal saline, then 150ml/kg of ½ DNS with ½ ampoule Kcl added

to it i.e 1.5-2 times the actual fluid requirement till dehydration is corrected.

Mean size of the hypertrophied pylorus assessed by ultrasonography was 4.8mm thickness, Length 21.5mm. Mean operating time for Laparoscopic surgeries compared to open procedure didn't have a significant difference (42min: 40min) with a p value of >0.01.

Average time taken for first feeds after surgery was 8.5 hrs following laparoscopic approach compared to 18.5hrs by open approach and time for full feeding (30hrs: 64hrs) was significantly shorter in the LP group than the OP group (p value <0.001).

Post-operative emesis was seen in 80% of cases operated by Laparoscopic procedure compared to 40% in open cases. This can be attributed to the fact that we start feeding much earlier in children's operated by laparoscopic procedure

The mean length of hospitalization was significantly shorter in LP group (5days: 8days). Even though the children's had vomiting immediately after starting feeds most of them improved within 24hrs and were stable by 48hrs. Taking into consideration the difference in the duration of hospital stay this would also reduce the incidence of hospital acquired infections

One death was noted in a case operated by laparoscopic approach and one case operated by Laparoscopy had wound site infection near the Umbilical port.

#### 5. Conclusion

When compared with open pyloromyotomy, the laparoscopic approach appears to be equally safe and effective, with shorter time to start feeds, reach full feeds, shorter hospital stay and with superior cosmetic results. Disadvantage being a greater expertise requirement and a learning curve. The authors conclude that laparoscopic pyloromyotomy is an equally good alternative procedure for the management of hypertrophic pyloric stenosis.

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