

“A COMPARISON BETWEEN OPEN AND LAPAROSCOPIC FEEDING JEJUNOSTOMY”

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ABSTRACT

Introduction: Corrosive intake is a social dilemma in our society and it is a leading cause of morbidity due to malnutrition caused by inability to feed through natural route in the victims. Some kind of procedure is needed to reestablish the natural route in survivors. This is usually accomplished by feeding jejunostomy mostly done by open method.

Objective: This study was meant to compare the outcome of LFJ and OFJ.

Materials and Method: This prospective randomized controlled trial was carried out at PGMI / AMC / LGH, Lahore for 2 years. During the period total of 60 patients were selected. In Gp A the LFJ while in Gp B the OFJ was performed. Outcomes of both were compared for pain, infection, bleeding, duration and cost of procedure. DM, HTN and ASA grades were accounted for while performing logistic regression. Age and sex stratification for outcome analysis was done. This study was approved by the ethical review committee of LGH, Lahore.

Results: The mean age of all cases was 27.70 ± 9.79 years. The male to female ratio was 1:5. After 72 hours of surgery, 1 (3.3%) cases in LFJ and 27 (90.00%) cases in OFJ had pain with significantly lower pain in LFJ with a p-value < 0.001 . Blood loss in LFJ was (11.03 ± 2.1 ml) as compared to OFJ (27.2 ± 5.4 ml). After 2 wks one of the cases (3.3%) in LFJ and 6 (20.0%) cases in OFJ had infection with p-value < 0.05 . Mean time for LFJ (47.4 ± 4.3 min) was less than needed for OFJ (58.6 ± 7.7 min).

Conclusion: It was concluded that LFJ was better than OFJ in terms of having less pain, bleeding, infection and duration of procedure, while cost of LFJ was exceptionally high.

Keywords: Laparoscopic feeding jejunostomy (LFJ), Open feeding jejunostomy (OFJ), Corrosive intake.

INTRODUCTION

Corrosive intake is a social dilemma in most societies. In many of these cases it leads to formation of strictures of swallowing pathway, making it difficult or sometimes impossible to eat or drink¹. They erode through mucosa causing bleeding and form strictures inside lumen, leading to blockade². With initial emergency management in form of IV fluids, pain killers, anti-peptic medication and par oral specific neutralizing agents³. Extensive monitoring and investigations are needed. Early endoscopy and intervention are known to improve outcome⁴. The acids cause more damage to stomach, due to pooling in gastric antrum caused by pylorospasm. Alkalis like caustic soda or bleaching agents cause fibrous strictures due to thrombosis of supplying vessels². Feeding jejunostomy is more popular these days to overcome nutritional deficiencies. LFJ is an alternative to OFJ but needs comparative analysis⁵. Dysphagia was graded into four types.

Grade I: Only solids not ingested. **Grade III:** Liquids are not ingested.

Grade II: Semisolids are not ingested. **Grade IV:** Even saliva is not ingested.

MATERIALS AND METHODS

A randomized controlled trial was conducted in the Department of Surgery, Unit – II, Lahore General Hospital (LGH) Lahore for duration of 24 months from 2017-2019. With non-probability, convenient sampling 60 patients of age 18-55 years of either gender, having dysphagia grade III & IV due to corrosive intake and no previous abdominal surgery were equally divided in two groups. Patients with ASA-III or above, malignancies, crohn's disease, mesenteric lymphadenopathy, intestinal tuberculosis or typhoid infection, tracheoesophageal fistula and pregnant females were excluded. Informed written consent was obtained after explaining the procedure to the patients along with all possible complications and their management. They were also

counseled for complications of delaying the treatment. Patient's demographic information, type of corrosive, degree of dysphagia and other parameters were recorded. Patients were then divided in two equal Gps by using "random number table" method. In "Gp A" FJ was performed by laparoscopic technique (LFJ). In "Gp B" FJ was performed by open surgery (OFJ). Dissection was carried out with the help of a diathermy, knife and scissors in open surgery while gut holding laparoscopic forceps, maryland forceps, laparoscopic scissors,

diathermy hook were used in laparoscopic technique ^{6,7}. Foley catheter (18-24 Fr) was used in both as a feeding tube and was sized according to the age of patient, general condition of abdomen, nature and status of the gut wall. Bleeding and duration of procedure were noted. After 24-48 hours feeding was started. Infection and pain were recorded twice, 1st during 72 hrs, and 2nd at 2 week time. Pain >30 on visual analogue scale was labeled as positive. Medication was kept same in all patients to exclude bias.

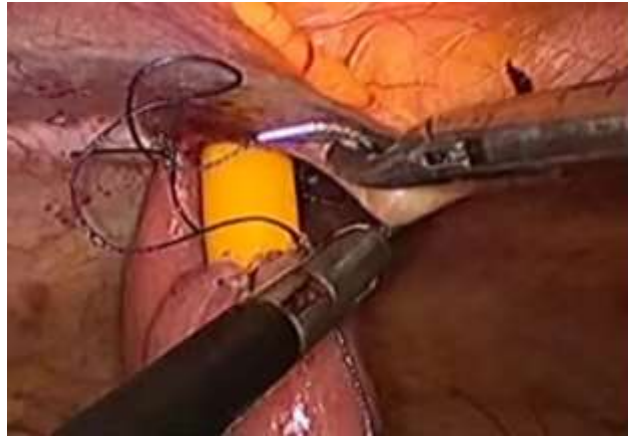


Fig 1: Laparoscopic Feeding Jejunostomy **Fig: 2** Open Feeding Jejunostomy

RESULTS

Table-1: Comparison of pain score (at 72hr)

		Study Gp		Total	Chi-square = 45.3		
		Gp-A	Gp-B				
Pain score (at 72 hrs)	No	29	3	32	P-value = 0.000		
		96.7%	10.0%	53.3%			
Yes	1	27	28	P-value = 0.000			
		3.3%	90.0%			46.7%	
Total		30	30			60	P-value = 0.000
		100.0%	100.0%			100.0%	

Gp-A and 27 (90.0%) cases in Gp-B had pain with significantly lower pain in Gp-A, with p-value < 0.001

At 2 wk, one of the cases (3.3%) in Gp-A and 6 (20.0%) cases in Gp-B had infection with no significant difference, p-value < 0.05. while no signs of infection seen in both Gps at 72 hours.

The results show grater blood loss in OFJ (27.2 ± 5.4 ml) as compared to LFJ (11.03 ± 2.1 ml). The maximum blood loss in LFJ is found to be less than minimum blood loss in OFJ.

Table-2: Comparison of Infection (at 2 wk.)

		Study Gp		Total	Chi-square = 4.043		
		Gp-A	Gp-B				
Infection (at 2 wk.)	No	29	24	53	P-value = 0.044		
		96.7%	80.0%	88.3%			
Yes	1	6	7	P-value = 0.044			
		3.3%	20.0%			11.7%	
Total		30	30			60	P-value = 0.044
		100.0%	100.0%			100.0%	

Table-3: Comparison of Per-OP bleeding

	Gp-A	Gp-B	Total
No of cases	30	30	60
Mean blood loss (ml)	11.03	27.20	19.12
Std. Dev.	2.07	5.39	9.102
Min blood loss (ml)	8	18	8
Max blood loss (ml)	15	39	39
Total blood loss (ml)	331	816	1147

Table-4: Comparison of Duration of procedure

	Gp-A	Gp-B	Total
No of cases	30	30	60
Mean OP time (min)	47.40	58.63	53.02
Std. Dev.	4.26	7.70	8.37
Min OP time (min)	42	45	42
Max OP time (min)	57	85	85
Total time (min)	1422	1759	3181

In Gp-A the mean DOP was (47.4 ± 4.3 min) and in Gp-B it was (58.6 ± 7.7 min). so it is concluded that more time is taken OFJ than in LFJ.

DISCUSSION

We found in this study that at 72 hours of surgery, 1 (3.3%) cases in Gp-A and 27 (86.7%) cases in Gp-B had pain with significantly lower pain in Gp-A, p-value < 0.001. We also found that after 2 weeks of surgery, one of the cases in Gp-A 1 (3.3%) and 8 (26.7%) cases in Gp-B had pain with significantly lower pain in Gp-A, p-value < 0.05. This shows that laparoscopic surgery has lesser incidence of pain as compared to open group^{2, 11}. It is noted that early and late pain is equal in LFJ, while early to late pain ratio is 1:3.4 in case of OFJ. The female patients in both groups had more incidence of pain as compared to men while nullifying the effects of all other parameters. This study confirmed the post-operative pain ratios in both groups to be similar to earlier studies^{7, 12}. At 2 wk, one of the cases (3.3%) in Gp-A and 6 (20.0%) cases in Gp-B had infection with p-value < 0.05. While no signs of infection seen in both Gps at 72 hours. This clearly depicts a lower incidence of infection rates in LFJ as compared to OFJ. Similar ratios are observed in other comparative studies¹³. The results show lesser blood loss in LFJ (11.03 ± 2.1 ml) as compared to OFJ (27.2 ± 5.4 ml). Total blood loss with same number of patients in both Gps was 331 ml in LFJ and 816 ml in OFJ which is less than half in former. A notable finding in this study is that the maximum blood loss in any LFJ procedure was less than the minimum recorded blood loss for OFJ procedure. In Gp-A the mean duration of procedure was (47.4 ± 4.3 min) and in Gp-B it was (58.6 ± 7.7 min). So it is concluded that lesser time is taken for LFJ compared to OFJ⁷. But this parameter is highly operator dependent as some surgeons with lesser hands on training for laparoscopic instruments took more times for LFJ than OFJ. This finding contradicts with some of the previous researches as they mention laparoscopic technique to be more time consuming^{7, 14}. There is also a longer learning curve observed for LFJ while in case of OFJ the learning curves are steeper. There was seen a strong positive association of diabetes and wound infection at 2 wks post-OP found on logistic regression tabulation. So it

was concluded that diabetic patients have more incidence of infection as compared to the non-DM patients^{2, 4, and 6}. The results were highly significant with a P-value < 0.001, and a high association magnitude of 24.085 was noted. The onetime charges for individual patient were less (almost half) in case of LFJ than in OFJ. While cost of establishing a laparoscopic setup was exceptionally high (up to 12-14 times) as compared to the open surgery ranging in millions of rupees. So finally we come to see that over the time all the parameters under consideration above have remained constant for example pain, infection and bleeding. The overall duration of procedure has started to drop in favour of LFJ than for OFJ with the advent of laparoscopic surgery. Easily available instruments, proper training, better outcomes have made laparoscopic surgery more popular contributing a lot to improvement of minimally invasive surgical practice.

CONCLUSION

It is concluded that a better outcome is observed after laparoscopic feeding jejunostomy (LFJ) as compared with open feeding jejunostomy (OFJ) in terms of per OP bleeding, post OP pain, post OP infection and duration of procedure. There is a grater patient comfort and faster recovery post procedure with earlier nutrition. The onetime charges for individual patient were less in laparoscopic than in open surgery. While cost of establishing a laparoscopic surgical setup was exceptionally high (up to 12-14 times i.e. 10-12 million in LFJ) as compared to the open surgery. There is no conflict of interest to declare.

REFERENCES

1. Temiz A, Oguzkurt P, Ezer SS et al., (2012) "Predictability of outcome of caustic ingestion by esophagogastroduodenoscopy" *World J Gastroenterol* 18(10): 1098-1103
2. Norman S. Williams, Christopher J.K. Bulstrode, P. Ronan O'Connell, (2013), "Bailey and Loves Short Practice of Surgery 26th Ed" CRC press. Ch:62, pp: 994-5.
3. Charles Brunnicardi, Marry L. Brandit, Dana K. Anderson. (2016), "Schwartz's Principles of Surgery, 10th Ed" McGraw Hill, Ch:02, pp: 55-56.
4. Josef E. Fischer, Daniel B. Jones, Frank B Pomposelli et al, (2016), Fischer's Mastery of surgery, 6th Ed 2012, Walter and Lippincott, Ch: 67, page: 826.Vol; 24(1), Pages: 22-7.
5. Tuna M, Latifi R, El-Menyar A, Al Thani H et al. (2013 Jun), "Gastrointestinal tract access for enteral nutrition in critically ill and trauma patients: indications, techniques, and

- complications.” *Eur J. Trauma Emerg Surg*, Vol; 39(3), Pages; 235-242.
6. Margaret Farquharson, James Hollings head (Nov 2014), Farquharson’s text book of operative general surgery, 10th Edition, CRC press, London, pp
 7. Mistry RC, Mehta SS, Karimundackal G, Pramesh CS. (Apr 2009); “A novel cost effective method of laparoscopic feeding-jejunosomy”. *Journal of Minimal Access Surgery*. Vol. 5:2, Pages 43-6.
 8. Courteny M. Townsend, R. Daniel Beauchamp, B. Mark Evers, Kenneth L. Mattox, (2012) “Sabiston’s textbook of Surgery”, 19th Ed, Ch:02, p:135.
 9. Arunachalam R, Rammohan A, (2016 jul) “Corrosive Injury of Upper Gastrointestinal tract: A Review.” *Arc Clin Gastroenterol*, Vol.2 (1), pages 56-62.
 10. Chibishev A, Pereska Z, Chibisheva V et al., (2012) “Corrosive Poisonings in Adults” University Clinic of Toxicology, Clinical Center Skopje, Republic of Macedonial University “Ss Cyril and Metodius”. *Mat Soc Med*. 2012 Jun; 24(2): 125-130
 11. Jimenez RM, Lee MR, Pigazzi A, (2012 Oct), “Trocar guided LFJ: a simple new technique.” *Surg Laparosc Endosc Percutan Tech*, Vol, 22:5, Pages:250–3.
 12. Liu YY, Liao CH, Chen CC, (2014 Jan), “Single-incision laparoscopic assisted jejunostomy tube placement” *J. Laparoendosc Adv Surg Tech*. Vol; 24(1), Pages: 22-7.
 13. Speer EA, Chow SC, Dunst CM, et al, (2016 May), “Clinical Burden of LFJ Tubes”. *J. Gastrointest Surg*, Vol, 20:5, Pages 970-975.
 14. Young MT, Troung H, Gebhart A, et al. (Jan 2016). “Outcomes of LFJ tube placement in 299 patients”. *Surg Endosc*, Vol. 30: Page 126-131.