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APPENDICECTOMY;
ASSESSMENT OF CAECAL INVAGINATION OF APPENDICULAR STUMP

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ABSTRACT... Objective: To evaluate the usefulness of invagination/burial of appendicular stump after removal of appendix. **Design:** A prospective, non randomized comparative study. **Setting:** CMH Kharian and PAF Hospital Mianwali. **Period:** 2005-2007. **Patients and Methods:** Three hundred patients were included in this study. Appendicectomy was performed through Lanz incision .After removal of the appendix stump was buried/ invaginated in 150 patients while it was not buried in other 150 patients. 198 patients were males and 102 patients were females. The youngest patient was 14 years old and the eldest was 55 years old. Perforated and gangrenous appendices were not included in this study. **Results:** There was hardly any difference in outcome of patients in both groups except that 10 patients in first group had longer hospital stay due to symptoms like more pain, fever and infection. **Conclusion:** Burial or otherwise of appendicular stump does not make much difference. It was concluded that there was no added benefit of invagination of appendicular stump rather it takes more operative time and at times it has negative implications too.

Key words: Appendicectomy, Appendicular Stump, Invagination

INTRODUCTION

Acute appendicitis is quite a common disease and appendicectomy is bread and butter of general surgeon. It is often the first major operation performed by a surgeon in training[1]. According to few acute appendicitis is the most frequent emergency. Its life time incidence is said to be one in seven[2].

General scheme of a particular procedure remains the same in almost all operations, but slight variations do exist and various surgeons have difference of opinion in few steps of operations.

Appendicectomy is the procedure which has been performed for long time and after removal of appendix, appendicular stump used to be buried by purse string suture by almost all surgeons, but later surgeons realized that burial of appendicular stump is unnecessary, time consuming and likely to be associated with abscess formation. Senior surgical colleagues and standard textbooks of surgery still advocate the invaginatioh of appendicular stump.

This study was carried out to evaluate/compare the rationale and usefulness or otherwise of invagination of appendicular stump with purse string/z-suture after removal of appendix.

PATIENTS AND METHODS

Patients (n=300) of all age groups and both sexes were included in this study who underwent appendicectomy. Most of the patents were of the age groups 15- 30 years. Cases of gangrenous and perforated appendices were excluded from the study because invagination of appendicular stump was irrational in these cases. In operation notes and in the proforma provided, record of invagination of appendicular stump was maintained. Patients were followed up to six months post operatively. All patients received inj. ceftriaxone one gram 12 hourly and inj metronidazole 8 hourly for 48 hours. Stitches were removed on 8-10th post operative day. In follow up record of antibiotics, postoperative pain, postoperative pyrexia, post operative day of discharge and wound infection was maintained.

RESULTS

Total three hundreds and twelve (312) patients were operated for acute appendicitis but 12 patients were excluded from the study because they were found to have perforated or gangrenous appendices and in these invagination of stump was altogether irrational. Out of 300 patients 198 were males and 102 were females. Most of the patients were from age group 15-30 years. Male to female ratio was 8:5 (1.6:1). 64.7% (n=202) patients were of age groups ranging from14-25 years. 29.5 % (n=92) patients were of the age group ranging from 25-30 years. 5.7% (n=18) patients were above age

Fever	Less than 99 F	99-100	More than 100 F	P-Value
Group I	110 (73.3%)	30 (20%)	10 (6.7%)	0.136
Group	117 (78%)	30 (20%)	3 (2%)	

Hospital stay	2 Day	2-4 Day	More than 4 Day	P-Value
Group I	120 (80%)	20 (13.3%)	10 (6.7%)	0.138
Group II	127 (84.7%)	20 (13.3%)	3 (2%)	

Infection	Superficial	Deep	Total	P-Value
Group I	6	4	10 (6.7%)	0.05
Group II	2	1	3 (2%)	

Pain	Mild	Moderate	Severe	P-Value
Group I	70 (46.7%)	65 (43.3%)	15 (10%)	0.345
Group II	85(53.1%)	65 (40.6%)	10 (6.3%)	

of 30 years. Amongst them 10 were between ages of 30-40 and 7 patients were from age group 40-50. One patient was 55 years of age. All Appendices were subjected to histopathological examination which showed mild to severe inflammation in all the cases.

Patients of both groups in this study did well postoperatively All the patients were discharged on third postoperative day except ten patients in invaginated group who were discharged on fifth post operative day (two days longer stay).There was no significant additional symptom or sign in any patient of both groups except for more pain, pyrexia and infection were noted in ten patients of invaginated group.

- **MILD** Requiring Injection Dicloran on first day and Tablets on second day
- **MODERATE** Requiring Injection Dicloran after first day.
- **SEVERE** Requiring Injection Nalbin in addition to Dicloran

DISCUSSION

According to literature first appendicectomy was performed by Claudius of Saint George hospital in 1736[3]. Afterwards it has been the commonest intra-abdominal operation[4]. The Incidence varies from 1.5/1000 in males to 1.9/1000 in females[5,6].

After removal of appendix it had been a common practice about two decades earlier to burry the appendicular stump with purse string or Z-suture. Standard textbooks of surgery and our senior surgeons still advocate burial of appendicular stump. But various research workers have proved that caecal invagination of appendicular stump is not necessary.

Large prospective trial involving traditional open surgery has shown no advantage with inverting the base of the appendix according to British Journal of Surgery[7]. It has been found in a study by Naeem Shahid and Khalid Ibrahim that there is no added benefit of invagination of appendicular stump rather it took more operative time and at time it was hazardous to do so[8]. Same has been proved in our study.

In a study by A. P. Sinha no detrimental effect was noted following simple ligation where as patients who had

stump invagination remained in hospital on average more than a day longer, mainly occurring due to a higher incidence of wound infection (16 percent against 6 percent)[9].

In a study by a French author it was found that caecal invagination of an appendicular stump resulted in sub acute inflammatory complications simulating a benign tumour of the caecum[10]. Thus author has discouraged invagination of appendicular stump concurring our conclusion. In laparoscopic appendicectomy simple ligation of the base of appendix is done and stump is not invaginated. In a study on laparoscopic appendicectomy variation occurred for particular cases requiring the introduction of a stabbing device[11].

In another study in Mayo Hospital and Ganga ram Hospital it was concluded that there was no added benefit of invagination of appendicular stump, rather it was more time consuming for the surgeon and more discomforting for the patient[12].

Our study of 300 appendicectomies has also proved that simple ligation of appendicular base would suffice and invagination of the stump is unnecessary provided the operating surgeon is confident of secure simple ligation of the base of appendix.

In a study of appendicectomies in district hospitals it has been suggested that after ligation and division of base of the appendix, and ligation of blood vessels in meso-appendix the appendicular stump should be invaginated.

CONCLUSION

In our study we have found out that there is no additional benefit of caecal invagination of appendicular stump and it seems unnecessary. If the operating surgeon is confident about the secure ligation of appendicular base, he can leave it as such. Invagination of appendicular stump takes more time .Moreover it can result in formation of caecal abscess, subacute inflammation of caecum at the site simulating benign tumour and has more risk of wound infection.

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