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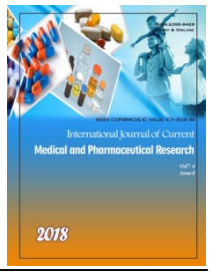

COMPARISON OF CLIP APPLICATION VS SUTURE LIGATION OF CYSTIC DUCT AND CYSTIC ARTERY IN OPEN CHOLECYSTECTOMY: A RANDOMIZED CONTROLLED TRIAL

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ABSTRACT

Open cholecystectomy has been a gold standard for hundred years before the laparoscopic technique emerged. The purpose of this research was to compare clip application with suture ligation of the cystic duct and artery in patients undergoing open cholecystectomy. The time consumed after dissecting the triangle of Calot to ligating the structures was noted for each participant and leakage of bile was also observed post-operatively. A randomized control trial was performed, and patients were divided into two groups for allocation of clip or suture ligation. Out of the 95 patients 93.7% were females, 24.5% cases of suture ligations were performed in less than 5 minutes compared to 89.1% cases of clip ligation. Only 11 cases revealed biliary leakage post-operatively out of which suture ligation was performed in 10 cases. These findings show that clip ligation is a better option in terms of time consumption during procedure and biliary leakage after surgery.

INTRODUCTION

Cholecystectomy is referred to as the surgical removal of gall bladder. It is the most common treatment for symptomatic gallstones and other gall bladder conditions[1]. Cholecystectomy can be performed using two techniques namely 'open cholecystectomy' and 'laparoscopic cholecystectomy' in which a camera is used [2]. Gall stones and their sequlae are amongst the oldest afflictions of mankind, but the credit for its definitive treatment i.e. open cholecystectomy goes to the German surgeon Carl August Langenbuch who performed it in 1882. It remained the gold standard treatment for gall stones for over a century[3].

Complication of cholecystectomy usually include bile duct injury, wound infection, bleeding, retained gall stones, abscess formation and stenosis of the bile duct [4]. By 2014 laparoscopic cholecystectomy has become the gold standard of treatment of symptomatic gall stones [5] and in certain conditions this technique can be converted into an open surgery if the patient has unusual anatomy or the surgeon can't see well enough through the camera or the patient is found to have cancer [6]. In underdeveloped countries, due to lack of modern medical facilities, open cholecystectomy is still considered the standard.

During open cholecystectomy the surgeon usually follows the top down approach and starts with dissection of fundus and proceeds towards the portal triad and the triangle of Calot. Then the cystic artery and cystic duct are identified and ligated using a suture or a clip and then the gall bladder is removed. The suture used in this procedure is catgut or vicryl. Catgut is absorbed completely in 90 days and the tensile strength remains for at least 7 days, vicryl holds its tensile strength for two to three weeks and is completely absorbed by hydrolysis within 56-70 days. Whereas the ligation clip has further two types. These are made up of a polymer which is absorbable or a metal titanium which is non-absorbable. However, in the modern world the use of sutures for the purpose of ligation has been minimized due to ease of application of the clips but the question remains as to which is better.

MATERIALS AND METHODS

Purpose of this study was to compare clip application versus suture ligation of cystic duct and cystic artery in open cholecystectomy in terms of duration of surgery and postoperative biliary leakage.

Operational Definitions

Duration of surgery: The time duration counting from completion of dissection of Calot's triangle, exposing both duct and artery to cutting of both structure after clipping or suturing.

Biliary leakage: Drainage of yellow fluid greater than 30 ml postoperatively.

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Study Design

The study was conducted in the form of randomized control trial in a tertiary care hospital of Lahore, Pakistan in the duration of 6 months. Participants were selected through non-probability purposive sample with a sample size of 94. Patients of both genders with age 15 years and above with symptomatic gall stones were considered in the research. Exclusion criteria was also defined as patients who were suffering from cholelithiasis with an acute cholecystitis or pancreatitis, mucocele or empyema of gall bladder, patients undergoing subtotal cholecystectomy and patients not willing to give consent for the procedure.

Data Collection

There was no risk to the involved patients and an approval was sought for study by ethical committee of the hospital. Patients fulfilling the inclusion criteria were recruited from out-patient department. The participants were randomly allocated in two groups namely group A and group B using a random letter method, for group A, suture ligation of the cystic duct and cystic artery was performed during surgery. For group B: clip ligation of the cystic duct and cystic artery was performed. Clinical findings of the surgery were noted down as well as the duration of surgery. All the patients were evaluated for any biliary or blood leakage from the drains attached. All data was recorded in especially designed proforma (attached).

Data Analysis

The data was entered in the SPSS version 22 and analyzed through its statistical program. Frequency and percentages were calculated for quantitative data. A p value of 0.05 or less was taken as significant. T test and chi square tests were applied in order to compare data of both groups.

RESULTS

Out of the 95 participants of the study 89(93.7%) were females and 6(6.3%) were males. The most common age group was 36-45 years contributing to 34(35.8%) patients with 26-35(26%) being the second most common as shown in table 1.

Table 1 Basic characteristics of the study participants

Charaterisitic	Frequency
Age:	
15-25	13(13.7%)
26-35	26(27.4%)
36-45	34(35.8%)
46-55	17(17.9%)
56-65	5(5.3%)
Gender:	
Male	6(6.3%)
Female	89(93.7%)

Table 2 shows the time taken during surgery and presence of bile leakage in procedures involving suture ligation and clip application. It can be clearly observed from the results that 49 patients were recruited in group A and 46 were included in group B. 24.5% of the suture ligations were performed under 5 minutes whereas 89.1% of clip ligations were done in this time. No clip ligation took more than 10 minutes of duration but a few of suture application took between 11 and 15 minutes (12.2%). Leakage of bile was mostly seen as a complication of suture ligation amounting to 20.4% of the procedures performed with this method. However, only about 2% of surgeries performed through clip application resulted in biliary leakage.

Table 2 Comparison of clip application with suture ligation of cystic artery and cystic duct.

Ligation of cystic duct and artery	Duration of surgery in minutes			Leakage of Bile		Total
	0-5 (55.8%)	6-10 (37.9%)	11-15 (6.3%)	Yes (11.6%)	No (88.4%)	
Suture ligation	12 (24.5%)	31 (63.3%)	6 (12.2%)	10 (20.4%)	39 (79.6%)	49(51.6%)
Clip ligation	41 (89.1%)	5 (10.9%)	0	1 (2.2%)	45 (97.8%)	46(48.4%)

DISCUSSION

Open cholecystectomy has become obsolete in many parts of the world, but it is still considered the standard in underdeveloped countries due to lack of facilities and equipment. Furthermore, suture ligation of the cystic duct and artery is preferred equally compared with clip ligation. However, clip ligation has proven to be a better choice in terms of ease of application and post-surgery complications such as bile leakage also shown by another study in USA in year 1996[7].

However, a study has shown that migration of clips can cause formation of gall stones around them[8] or further leading to local ischemic damage if the penetration within the bile tract has occurred. A case report showing a foreign body in a 57 year old man who has gone a cholecystectomy revealed that the foreign body was infact a clip which had migrated into the bile duct[9][10]. These researches have revealed a slight preference towards the use of suture, but some cases have been reported showing migration of suture from the original place.

Also, the time consumed in suture ligation is more in contrast with the clip locking. In most cases, clip ligation took less than 5 minutes which proves its ease of application and there were very few cases reported with biliary leakage post-operatively compared with usage of suture shown by this research and many others[11] The drawback of clip lock is that it need a clip ligator for application which is an expensive instrument. There have been cases in which the patient underwent another surgery just to correct the complication caused due to leakage of bile.

Further studies are needed to check the efficacy of clip in comparison with sutures to strengthen the argument in favor of the clip in terms of ease of application and post-surgical complications such as biliary leakage.

CONCLUSION

Clip ligation is much safer in terms of post-operative complications such as biliary leakage and this choice is less time consuming compared with suture ligation.

References

1. Abraham S, Rivero HG, Erlikh IV, Griffith LF, Kondamudi VK (May 2014). "Surgical and nonsurgical management of gallstones". American Family Physician. 89 (10): 795-802. PMID 24866215.
2. Mulholland MW, Lillemoe KD, Doherty GM, Upchurch GR, Alam HB, Pawlik TM. Greenfield's surgery: scientific principles & practice (Sixth ed.). Philadelphia. ISBN 978-1-4698-9001-2. OCLC 933274207.

3. Utpal De. Evolution of cholecystectomy: Atribute to Carl August Langenbuch. *Indian J Surg* 2004; 66(2): 97-100.
4. Shackelford's surgery of the alimentary tract. Yeo, Charles J., (Eighth ed.). Philadelphia, PA. 2018. ISBN 0323402321. OCLC 1003489504.
5. Jaunoo SS, Mohandas S, Almond LM (2010). "Postcholecystectomy syndrome (PCS)". *International Journal of Surgery*. 8 (1): 15-7. doi:10.1016/ j.ijsu.2009.10.008. PMID 19857610.
6. Brunicardi FC, Andersen DK, Dunn DL, Hunter JG, Matthews JB, Pollock RE, Billiar TR (2014). Schwartz's principles of surgery (Tenth ed.). ISBN 978-0-07-179674-3.
7. Leppäniemi, A., *et al*. (1997). "Common bile duct repair with titanium staples." Surgical Endoscopy 11 (7): 714-717.
8. CETTA, F., *et al*. (1997). "Migration of Metallic Clips Used During Laparoscopic Cholecystectomy and Formation of Gallstones around Them: Surgical Implications from a Prospective Study." *Journal of Laparoendoscopic & Advanced Surgical Techniques* 7 (1): 37-46.
9. Fujita, N., Noda, Y., Kobayashi, G., Kimura, K., Watanabe, H. and Mochizuki, F. (1994), Foreign Bodies in the Bile Duct After Laparoscopic Cholecystectomy. Digestive Endoscopy, 6: 287-290. doi:10.1111/j.1443-1661.1994.tb00381.x
10. Ray, S., & Bhattacharya, S. P. (2013). Endoclip Migration into the Common Bile Duct with Stone Formation: A Rare Complication after Laparoscopic Cholecystectomy. *JSLS : Journal of the Society of Laparoendoscopic Surgeons*, *17*(2), 330-332. http://doi.org/10.4293/108680813X13654754534350
11. Rohatgi, A. and A. L. Widdison (2006). "An audit of cystic duct closure in laparoscopic cholecystectomies." Surgical Endoscopy and Other Interventional Techniques 20 (6): 875-877.

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