



General Surgery

EVALUATION OF G10 SCORING SYSTEM IN PREDICTION OF DIFFICULT LAPAROSCOPIC CHOLECYSTECTOMY INTRAOPERATIVELY IN A TERTIARY CARE CENTER IN SILCHAR, ASSAM

Dr. Anshul Thakur	Postgraduate trainee, Department of General Surgery, Silchar Medical College, Silchar, Assam, India
Dr Asik Ikbal Mazumder*	Assistant professor, Department of General Surgery, Silchar Medical College.*Corresponding Author
Dr. Susmita Paul	Postgraduate trainee, Department of General Surgery, Silchar Medical College, India

ABSTRACT **Introduction:** Laparoscopic cholecystectomy is the gold standard for the management of gall bladder pathologies. It has variable outcomes and conversion rates. The G10 Scoring system is used to predict the difficulty and outcome of surgery primarily the ability to complete the operation laparoscopically. **Aims And Objective:** Intraoperative assessment of gall bladder and surgical difficulty in laparoscopic cholecystectomy. The objective is to correlate the relation between the G10 scoring system, bailout procedure, and conversion into open cholecystectomy. **Materials and method:** This is a prospective observational study of All patients undergoing laparoscopic cholecystectomy in Silchar Medical College in six months. **Result:** There was a significant and positive correlation between the G10 score with the bailout procedure. Testing the G10 score on the validation set yielded an AUROC=0.911, and the score ≥ 3 indicates subjects at high risk and went bailout procedure. **Conclusion:** This study showed that the G10 score has good accuracy in predicting a bailout procedure and conversion. The use of G10 scores intraoperatively is "essential" to provide valid and objective assessment in determining the difficulty of surgery. When the G10 score is 1 or 2, it's safe to perform the critical view of safety (CVS) technique. Whereas, if the G10 score is 3 or greater, the surgeon should consider the bailout procedure and conversion to open cholecystectomy.

KEYWORDS : Bailout, CVS, G 10, laparoscopic cholecystectomy.

INTRODUCTION:-

Laparoscopic cholecystectomy has become the gold standard for the surgical management of gallstone disease due to its minimally invasive nature and associated benefits such as reduced postoperative pain, shorter hospital stays, and faster recovery. However, not all Laparoscopic cholecystectomy procedures unfold smoothly, and surgeons may encounter challenging cases that require advanced skills and expertise. The prediction of difficult laparoscopic cholecystectomy is crucial for optimizing patient outcomes and avoiding intraoperative complications.

In recent years, various scoring systems have been developed to assess the likelihood of encountering difficulties during LC. One such system that has gained attention and recognition is the G10 scoring system. This system incorporates ten key factors that are predictive of the complexity of the procedure, offering surgeons a valuable tool to preoperatively evaluate the potential challenges they may face.

The G 10 scoring system takes into account a combination of patient-related factors, gallbladder characteristics, and preoperative imaging findings. By assigning scores to each parameter, surgeons can stratify patients into different risk categories, allowing for better preoperative planning and resource allocation. This systematic approach enables surgeons to identify cases that may benefit from additional precautions, specialized equipment, or consideration of alternative surgical approaches.

Understanding and implementing the G 10 scoring system can contribute significantly to improving patient safety and surgical outcomes. Surgeons armed with this predictive tool can tailor their approach based on the anticipated difficulty, potentially reducing operative time, minimizing complications, and enhancing overall procedural success.

This paper aims to review the existing literature on the G 10 scoring system, summarizing its development, validation studies, and practical applications. By synthesizing the available evidence, we seek to offer insights into the potential impact of this scoring system on the field of laparoscopic cholecystectomy and its role in advancing the precision and safety of surgical interventions. As we explore the strengths and limitations of the G 10 scoring system, we also consider avenues for future research and refinement, with the ultimate goal of improving our ability to predict and manage difficult laparoscopic cholecystectomy cases.

MATERIALANDMETHOD:-

This is a prospective observational study The study was carried out in the Department of General Surgery at Silchar Medical College and Hospital Silchar. It consisted of 68 cases of laparoscopic cholecystectomy from March 2023 to August 2023. Each subject observes the points as follows:

Gallbladder adhesion, gallbladder distention or contraction, operator's inability to hold the gallbladder without decompressing or without injuring the gallbladder, impacted stones of >1 cm in Hartmann's pouch, body mass index >30 , adhesions following previous surgery related to gallbladder exposure, presence of bilious fluid or pus beyond the gallbladder and presence of fistulas/Mirizzi type 2 or 3.

RESULT:-

The surgical technique of laparoscopic cholecystectomy for each subject was noted and divided into two groups; those are the Critical View of Safety (CVS) technique group and the bailout procedure group, consisting of Fundus First cholecystectomy (FF), Subtotal Cholecystectomy (SC), and open surgery conversion. 68 patients had laparoscopic cholecystectomy surgery from 1 March 2023 to 31 August 2023. The median of the G10 score for subjects with a critical view of safety (CVS) was 1 (range 1-6). The median of the G10 score for subjects who had bailout procedures was 4 (range 2-8).

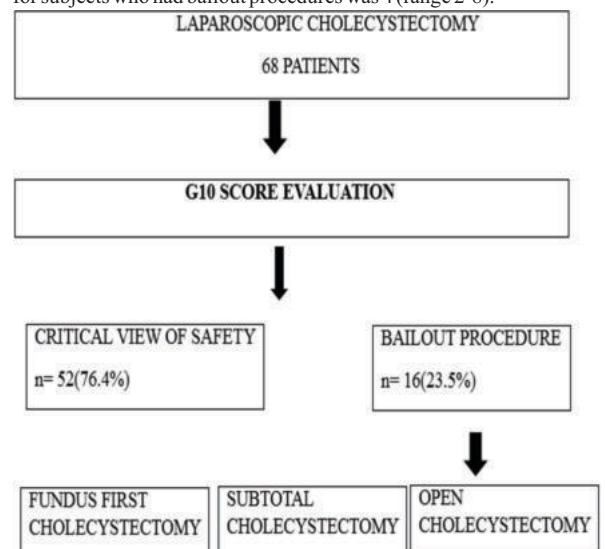


Table 1: Intraoperative assessment parameters of G10 Score

Intraoperative assessment parameters	CVS	Bailout
1. Gallbladder adhesion <50% (score 1)	42	3
≥50% (score 2)	11	6
Completely buried gallbladder (score 3)	2	4
2. Distended or contracted gall bladder	14	5
3. Inability to grasp without decompression (score 1)	2	11
4. Stone >1cm impacted in Hartmann's pouch (score 1)	3	3
5. BMI>30 (score 1)	12	4
6. Adhesion from previous surgery (score 1)	2	3
7. Free bile or Pus outside the gall bladder (score 1)	1	2
8. Fistula (score 1)	0	1
G10 score = Total score obtained (range 1-10) 1		

Table2. Distribution of G10 score in CVS and bailout procedure

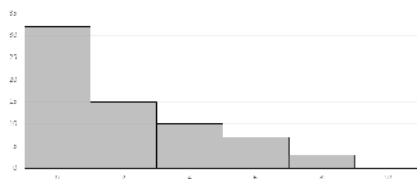
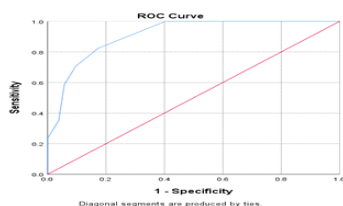
G 10 SCORE	CVS(n,%)	BAILOUT(n,%)
1	32(61.5%)	0(0%)
2	12(23.0%)	3(18.75%)
3	4(7.6%)	2(12.5%)
4	2(3.8)	2(12.5%)
5	1(1.9%)	3(18.75%)
6	1(1.9%)	2(12.5%)
7	0(0%)	3(18.75%)
8	0(0%)	1(6.25%)
9	0(0%)	0(0%)
10	0(0%)	0(0%)
TOTAL	52(100%)	16(100%)

Table3. Distribution of G10 in different types of bailout procedures, with duration of operation and intraoperative bleeding.

No.	Variables	CVS (n=52)	BAILOUT PROCEDURE		
			F (n=10)	SC (n=4)	Conversion (n=2)
1	G10 score (median, min-max)	1(1-6)	3(2-6)	6(6-7)	7.5(7-8)
2	Duration of operation in minutes (median, min-max)	150(45-320)	210(150-305)	285(180-390)	250(230-270)
3	Intra-operative bleeding in mL (median, min-max)	10(5-100)	20(5-300)	85(20-150)	525(350-700)

The area under the curve

Area	Std.Error	Lower Bound	Upper Bound
0.911	0.035	0.842	0.980

**Fig1:-** Frequency diagram of the G10 score**DISCUSSION:-**

The most common problem encountered on difficult gallbladder is adequate exposure. In this study, 14 subjects (20.5%) had a history of abdominal surgery. However, only four subjects (5.8%) had difficulty in gallbladder exposure due to adhesion and required for adhesiolysis. Although impossible to accurately predict what surgery might lead to adhesions that may impact gallbladder exposure, the scar may warn the surgeon to consider the first trocar insertion for the camera port.

The median G10 score among the groups was different. The Critical View of Safety (CVS) has the lowest median score, followed by Fundus First cholecystectomy (FF) and subtotal cholecystectomy (SC). The conversion has the greatest median score. In this study, most of the surgical techniques used were CVS (76.4%). The CVS had a shorter surgery duration, less intraoperative bleeding, less pain on the first postoperative day, and a shorter postoperative length of stay than the others. There was no biliary trauma in the CVS group.

Fundus-first cholecystectomy (FF) is the common bailout technique used (14.7%). With a technique, the triangle of safety may be exposed better in difficult cases.[1] Previous studies have shown that fundus first reduces conversion potency from 5.2% to 1.2%.[2] Another study also reported that the FF group showed a lower prevalence of conversion, a lower complication, and a shorter length of postoperative treatment than the conventional group[3]. There was no biliary injury in the FF technique.

Laparoscopic subtotal cholecystectomy (SC) was performed on (5.8%) of subjects. The SC technique was used for severe adhesion on the safety triangle, where it was hard to identify and dissect the cystic structure. The technique is rarely used in SMCH compared to the FF technique. This finding differed from the previous study showing a technique widely used by the surgeon than the FF technique.[4] Another study shows The risk of complication in the SC technique is probably higher than FF technique.[5] In a non-succeeded case, the SC technique is considered.[6] The SC technique required a longer duration of surgery than CVS and FF. In this study, no complications were found in subjects with the SC technique.

There were 2 patients (2.9%) of conversion in the study because of adhesions. This finding is similar to other studies.[7] In this study, conversion purposes for adequate exposure, using tactile sensation, and making better manipulation to prevent iatrogenic injury. The open cholecystectomy rate decreased because of both the patient's and surgeon's preferences. In this study, the conversion places the greatest median score, the longest duration of surgery, intraoperative bleeding, first-day postoperative pain, and the longest stay.

Evaluation using the ROC curve showed the G10 score has good accuracy in predicting the bailout procedure (AUC 0.911), with the cut-off value for predicting bailout procedures being 2.5 (sensitivity 72.2%, specificity 79.0%). The G10 score of 1 and 2 referred to the safe margin for the CVS technique. Should the G10 score greater than 3, the surgeon may consider using a bailout procedure (72.2% sensitivity).

In this study, the conversion places the greatest median score, the longest duration of surgery, intraoperative bleeding, first-day postoperative pain, and the longest stay. In an old study, it was reported higher morbidity and mortality in males, the elderly, and those with a history of abdominal surgery who proceeded with conversion than those who continued in laparoscopic cholecystectomy. A conversion must be carefully considered for the benefit and adjusted with the readiness of the surgical team.[8] However, the conversion is not considered a complication or failure of laparoscopic cholecystectomy. Good surgeons always have to put their patient safety first in any decision being made. With the G10 scoring system, the surgeon may assess the difficult surgery objectively, and decide an appropriate treatment to prevent biliary injury.

CONCLUSION:-

This study is a preliminary study conducted in the northeastern state of India where there is a demographically high prevalence of cholelithiasis. This study shows G10 score has good sensitivity and specificity to predict the bailout procedure and conversion in difficult laparoscopic cholecystectomy. When the G10 score is 1 or 2, it's safe to perform the CVS technique. Whereas, if the G10 score is 3 or greater, the surgeon should consider performing a bailout procedure or converting to open cholecystectomy.

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