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ORIGINAL ARTICLE

Perception and Attitude about Laparotomy Wound Closure among Thai Surgeons: A Survey Study

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ABSTRACT

Background: The guideline on laparotomy wound closure recommends appropriate fascia closure techniques; however, the perception and attitude of Thai surgeons about laparotomy wound closure have never been explored.

Objective: To assess the perception and attitude of Thai surgeons regarding laparotomy wound closure

Materials and Methods: A survey of 55 persons was conducted during a virtual hernia conference. A series of questions was asked and responses were retrieved. A descriptive analysis was subsequently performed.

Results: Of all the respondents, 50%–75% complied with recommendations in the guideline on abdominal wall closure. Non-compliance was primarily because of unfamiliarity. Mesh augmentation was not implemented in most of the respondents' practice because of mesh-related complications, unfamiliarity, and reimbursement concerns.

Conclusions: The guideline recommendation and real-life practice in the Thai surgery service differ to some extent.

Running title: Fascia closure survey

Keywords: Laparotomy closure, Small bites suture, Mesh augmentation, Perception and Attitude.

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Introduction

Almost 14 million cases of gastrointestinal tract surgery are performed per year globally.[1] Most gain access via an abdominal incision. If the fascia gap is not closed properly, fascia dehiscence (FD) or incisional hernia (IH) may develop. Therefore, several techniques were introduced to reduce the incidence of FD and IH.

The small tissue bites technique, by Millbourn et al.[2] and Deerenberg et al.[3], can reduce the incidence of IH from 18%-21% to 5.6%-13%. The small bites technique revealed that the ratio of the suture to wound length was greater than 4:1, and that the incidence of an associated hernia is lower. INLINE meta-analysis[4] also indicated that continuous suture was superior to interrupted stitches regarding fascial wound complications. These findings are in the European Hernia Society (EHS) guideline on abdominal wall closure.[5]

Another technique involves mesh implantation. Mesh hernioplasty was proposed by Lichtenstein[6] and has been widely adopted in hernia repair. It is now an essential part of every abdominal wall reconstruction. Mesh implantation should become a prophylactic indication. Many randomized clinical trials (RCTs)[7-17] and meta-analyses[18-21] report the benefits of prophylactic mesh-augmented fascia closure without significant problems. Nevertheless, using mesh in this new indication is relatively rare, especially in Thailand.

There is abundant evidence regarding abdominal wall closure; however, it has not been emphasized in Thai residency programs until recently. Moreover, no study has assessed the perception and attitude of Thai surgeons about the recommended techniques. This survey aims to explore this topic.

Materials and Methods

A survey was conducted during the webinar of the Laparoscopic Endoscopic Surgeons of Thailand (LEST) and Thai Hernia Society (THS) collaboration, which was held on June 11, 2020 and hosted by the Medtronic education team. Three surgeons, including two hernia experts (S.T. and A.T.), designed this survey. The survey was composed of 19 questions (in Thai language) and divided into three domains: characteristics of respondents, perception and attitude about laparotomy wound closure, and specific reasons for not performing index procedures (Table 1). Descriptive analysis was performed, and data were presented as frequency and percentage of each response according to each question.

Results

There were 55 webinar participants; however, only 18 respondents. Most respondents (75%) were experienced surgeons, as defined by having more than five years in surgical practice, and worked in both government/academic and private hospitals (65%). All respondents reported that they were familiar with incisional hernia repair.

Sixty-seven percent of respondents reported using running stitches with slowly absorbable sutures to close fascial wounds. Half of the respondents reported using the small bites technique routinely. Nevertheless, a significant number of respondents

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were unfamiliar or uninterested in small bites fascia closure (22% and 28%, respectively). Fifty percent of respondents reported regularly applying the 4:1 suture length to wound length ratio in their practice; however, only 6% measured the length of used suture materials and the patient's wound. The primary reason for not applying small bites and the 4:1 ratio rule was unfamiliarity. Sixty-one percent of respondents used retention suture when they thought it was appropriate.

Only one respondent performed mesh-augmented fascia closure in high IH risk patients, whereas two respondents applied mesh in emergency/urgency settings. Mesh-related complications, unfamiliarity, and reimbursement concerns were the leading causes of prophylactic mesh not being implemented. Fifty percent of respondents believed that absorbable mesh is the most appropriate mesh for prophylactic indication. Regarding mesh positions, respondents believed that the most appropriate position was preperitoneal, followed by retrorectus, onlay, and intraperitoneal. See Table 1 for more details.

Table 1. Survey questions and responses

Item	Question and Response	Number of Respondents (N = 55)	% of participants	% of respondents
Domain 1 Characteristics of respondents				
1	**How long have you worked as a surgeon?**			
	< 5 years	5	9	25
	5-9 years	5	9	25
	10-20 years	5	9	25
	> 20 years	5	9	25
	No response	35	64	-
2	**Which one best explains your practice setting?**			
	Government/Academic hospital	4	7	20
	Private hospital	3	5	15
	Both government/academic and private hospitals	13	23	65
	No response	35	64	-
3	**How many laparotomy cases do you usually perform per month?**			
	< 5 cases	9	16	50
	5-10 cases	5	9	28
	> 10 cases	4	7	22
	No response	37	67	-
4	**How familiar are you with incisional hernia repair?**			
	Very familiar	6	11	33
	Quite familiar	12	22	67
	Not familiar	0	0	0
	No response	37	67	-

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Table 1. Survey questions and responses (cont.)

Item	Question and Response	Number of Respondents (N = 55)	% of participants	% of respondents
5	**Which technique do you use for fascial closure of a laparotomy wound?**			
	Continuous suturing with nonabsorbable materials	3	5	17
	Continuous suturing with slowly absorbable materials	12	22	67
	Interrupted suturing with nonabsorbable materials	1	2	6
	Interrupted suturing with slowly absorbable materials	2	4	11
	No response	37	67	-
6	**Regarding the 4:1 ratio of suture length to wound length, which of the following best represents your knowledge and practice?**			
	Unknown	4	7	22
	Known but do not implement in routine practice	4	7	22
	Implement in routine practice, but do not regularly measure the wound and suture length to ensure a 4:1 ratio	9	16	50
	Implement in routine practice, and regularly measure the wound and suture length to ensure a 4:1 ratio	1	2	6
	No response	37	67	-
7	**Regarding small bites fascia closure, which of the following best represents your knowledge and practice?**			
	Unknown	4	7	22
	Known but do not implement in routine practice	5	9	28
	Implement in routine practice	9	16	50
	No response	37	67	-
8	**Have you applied retention stitches within the past one year?**			
	Yes	11	20	61
	No	7	13	39
	No response	37	67	-
9	**What is the reason for applying retention stitches? (can select more than one response)**	N = 11		
	Infection-prone wound	4	36	36
	High intra-abdominal pressure	10	91	91
	Emergency operation	3	27	27
	Other reasons	1	9	9
	No response	0	0	-
10	**To your knowledge, what is the approximate incidence of incisional hernia after midline laparotomy?**			
	5%–9%	11	20	61
	10%–19%	6	11	33
	20%–29%	1	2	6
	≥ 30%	0	0	0
	No response	37	67	-

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Table 1. Survey questions and responses (cont.)

Item	Question and Response	Number of Respondents (N = 55)	% of participants	% of respondents
11	**Which one best represents your knowledge and practice of mesh-augmented fascia closure for incisional hernia prevention in high-risk incisional hernia patients?**			
	Unknown	6	11	33
	Known scientific evidence but not interested in practicing	2	4	11
	Known and interested, but have never practiced	9	16	50
	Have already practiced	1	2	6
	No response	37	67	-
12	**Which one best represents your knowledge and practice of mesh-augmented fascia closure for incisional hernia prevention in emergency/urgency patients?**			
	Unknown	7	13	39
	Known scientific evidence but not interested in practicing	2	4	11
	Known and interested, but have never practiced	7	13	39
	Have already practiced	2	4	11
	No response	37	67	-
13	**To your knowledge, which mesh position should be used in augmented fascia closure for incisional hernia prevention?**			
	Onlay	2	4	11
	Retrorectus	6	11	33
	Preperitoneal	9	16	50
	Intraperitoneal	1	2	6
	No response	37	67	-
14	**To your knowledge, what kind of mesh should be used in augmented fascia closure in high-risk incisional hernia patients?**			
	Nonabsorbable synthetic mesh	7	13	41
	Absorbable synthetic mesh	10	18	59
	Biologic mesh	0	0	0
	No response	38	69	-
15	**To your knowledge, what kind of mesh should be used in augmented fascia closure in emergency/urgency patients?**			
	Nonabsorbable synthetic mesh	6	11	33
	Absorbable synthetic mesh	9	16	50
	Biologic mesh	3	5	17
	No response	37	67	-
16	**To your knowledge, what is the best mesh fixation technique for augmented fascia closure?**			
	Simple suture	12	22	67
	Transfascial suture	2	4	11
	Glue	1	2	6
	Tacks	0	0	0
	Self-gripping mesh	2	4	11

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Table 1. Survey questions and responses (cont.)

Item	Question and Response	Number of Respondents (N = 55)	% of participants	% of respondents
	No fixation	1	2	6
	No response	37	67	-
Domain 3 Reason for not performing the index procedure (only for respondents who know scientific evidence but do not apply in their practice)				
17	**What is the reason for not routinely apply the 4:1 rule/ Small bites technique in abdominal closure? (can select more than one response)**	N = 4		
	Lack of confidence in its efficacy	1	25	25
	Unfamiliarity	4	100	100
	Time-consuming	1	25	25
	Increasing cost	0	0	0
	No response	0	0	-
18	**What is the reason for not applying mesh augmentation in fascia closure in high-risk incisional hernia patients? (can select more than one response)**	N = 11		
	Lack of confidence in its efficacy	2	18	18
	Unfamiliarity	2	18	18
	Time-consuming	1	9	9
	A concern of possible complication	3	27	27
	Reimbursement concern	3	27	27
	No response	0	0	-
19	**What is the reason for not applying mesh augmentation in fascia closure in emergency/urgency patients? (can select more than one response)**	N = 9		
	Lack of confidence in its efficacy	0	0	0
	Unfamiliarity	4	44	44
	Time-consuming	0	0	0
	A concern of possible complication	4	44	44
	Reimbursement concern	3	33	33
	No response	0	0	-

Discussion

This study was conducted during a virtual meeting themed 'Laparoscopic hernia for optimal patient outcomes.' Hence, it can be assumed that respondents were leading practitioners of abdominal wall surgery, or at least interested in this field. The number of respondents who routinely applied small bites suturing was high, with the rule of 4:1 ratio of the suture to wound length being widely adopted among them. Nevertheless, the number of respondents who were unaware or uninterested in this fascia closure concept is unignorable.

Abdominal wound closure is rarely emphasized during residency training. Trainers usually focus on removing pathology instead of dealing with a fascial wound at the end of the operation.

Consequently, it is common to find that a junior member of the team performs incision closure. Moreover, some trainers still believe that the best fascial closure involves large bites and interrupted stitches. This possibly explains the unfamiliarity with new fascial closure concepts. Appropriate abdominal wall closure is essential for patients and for national saving. A French study reported that 4 million euros could be saved if the IH incidence were reduced by 5%.[22]

Using prophylactic mesh is very different. Because it involves foreign material implantation, low adoption rates are possible. Many well-conducted studies[14, 15, 17] have confirmed a mesh's efficacy; however, associated risks may make surgeons reluctant to embrace this technique. Surgical site infection is the most concerning risk, particularly regarding placing the mesh in an emergency or contaminated setting, although several studies[23, 24] have reported mesh safety in those situations. RCTs are still necessary for proving the benefit of mesh placement in a contaminated environment. Although the evidence of absorbable mesh is sparse, most respondents believe that absorbable mesh is the most suitable for prophylactic indication.[25, 26]

This study has some limitations, including that the sample population was small, and the response rate was low. Moreover, participants involved a group of surgeons who were interested in abdominal wall surgery. Therefore, the results might not particularly represent Thai surgeons. However, we believe that this study provides useful information on the practice of laparotomy wound closure and is a good start for further exploration. Given the survey study's low response rates, further study should be conducted in a larger population.

In conclusion, the small bites fascia closure technique was fairly adopted in the sample population. However, this could be improved by paying more attention to the appropriate closure technique during the training period. More scientific evidence is needed to persuade surgeons to implement mesh augmentation.

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Authors' contribution

This study was supervised by AT. AT, ST, and HM designed the questionnaire. Data were collected by ST. TA performed descriptive analysis. A manuscript was drafted by TA and revised by AT. All authors approved the manuscript before submission.

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