

Comparison of Primary Fascial Closure Rate in Open Abdomen Management: Wittmann Patch versus Abdominal Fascia Closure Device.

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Background:

The open abdomen (OA) is a common approach for managing intra-abdominal catastrophes in trauma and acute care surgery. Various temporary abdominal closure techniques may affect the ability to achieve primary fascial closure and further complications. This study aimed to compare the primary fascial closure rate using the Wittmann patch versus the non-invasive Abdominal fascia Closure Device (AbCLO).

Methods:

A retrospective analysis was conducted on trauma and emergency general surgery patients who underwent damage control laparotomy at two level 1 trauma centers in Canada and USA in 2017-2022. Demographics and clinical data, of those who were managed with Wittmann patch and AbCLO were recorded. The primary outcome measure was the ability to achieve primary fascial closure during the initial hospitalization.

Results:

A total of 77 patients, including 29 trauma patients and 48 emergency general surgery patients, met the inclusion criteria for the study. Among them, 49 patients were managed using the Wittmann patch while 28 patients were managed with the AbCLO. Patients' demographics were not different. The primary fascial closure rate with Wittmann patch (83.6%) did not differ significantly from AbCLO group (85.7%) ($p = 0.4$). Successful fascial closure took longer in the Wittmann patch (6.4 days \pm 5.1 days) compared to the AbCLO group (3.7 days \pm 2.1 days) ($p = 0.0015$). Nevertheless, the total number of trips to the operating room was significantly higher in Wittmann patch patients compared to the AbCLO group (mean, 2.4 \pm 1.7 vs. 1.8 \pm 1, $p = 0.04$).

Conclusion:

In patients with open abdomens, Wittmann Patch and the non-invasive AbCLO device can achieve a high rate of primary fascial closure, reducing the need for future abdominal wall reconstruction. However, all AbCLO devices were applied at the bedside without any surgical procedure. Significant differences in time to fascial closure and number of surgeries may be explained by utilization of both devices.

Table 1. Basic demographics and clinical outcomes.

	Wittmann Patch (n=49)	ABCLO (n= 28)	P value
Age, Mean (SD)	51.2 (16.23)	53,75 (19.18)	0.27
Male Sex, N (%)	33/49 (68.8%)	19/28 (67.8%)	0.48
Initial Diagnosis at Index Operation			
<ul style="list-style-type: none"> • Trauma • Emergency General surgery 	<ul style="list-style-type: none"> • 14/49 (28.6%) • 35/49(71.4%) 	<ul style="list-style-type: none"> • 15/28 (53.5%) • 13/28 (46,4%) 	
Timing of device Placement (days since index operation). Mean (SD)	4.7 (5) Range (0-29)	1.27, (0.6) Range (1-3)	0.000024
Total number of abdominal takebacks/explorations performed. Mean (SD)	2.4 (1.7)	1.8 (1)	0.043295
Time to closure following device placement (days)	- Median, (IQR) 4 (3, 9)	- 3 (3,4)	0.0015
Primary fascia closure (PFC) N (%)	41/49 (83,6%)	24/28 (85,7%)	0.4