



LETTER TO EDITOR

Retraction of the edge of rectus sheath after midline laparotomy



Dear Editor,

A recent study evaluating ability to obtain a 4:1 suture to wound length ratio in a surgery residency program could achieve it in only 76/100 study patients; showing the difficulty in integration of theory into practice.^{1–4} This led us to use ink marking of rectus sheath (for correct distance between suture bites and distance from the edge) in a patient-based training model for midline laparotomy closure. Edges of cut rectus sheath retracted immediately, and ink mark gave inaccurate measurement of distance from the edge; prompting us to study extent of rectus edge retraction in midline laparotomies.

We conducted this prospective observational study in a tertiary teaching hospital in Central India. Patients undergoing upper midline laparotomy for emergency acute abdomen and routine surgeries were included; previously operated patients were excluded. Clinical data including age, gender, and BMI were recorded.

Anterior rectus sheath was exposed by midline skin incision. Midline of rectus sheath was marked using a marking pen and on each side of midline 1 cm laterally, marks were put in the upper middle and lower part of the anterior rectus sheath – using a scale. Abdomen was opened by cutting rectus sheath exactly in the midline, leading to retraction of cut edge of rectus sheath. The distance of retracted mark in rectus sheath from the cut edge was measured using electronic digital Vernier caliper (Manufactured by Outgeek, available at Amazon India, measuring range: 0–300 mm, accuracy 0.02 mm) in the upper, middle and lower part of incision (Fig. 1). Operative procedure was carried out as planned. Results were analyzed statistically by On-line Software Medcalc (<https://www.medcalc.org/>); using comparison of means and 2×2 Chi square tables.

28 patients (Age 41.53 ± 15.29 years; 24 males and 4 females; BMI 22.41 ± 3.21) were studied during emergency and 20 patients (Age 46.5 ± 17.15 years; 18 males and 2 females; BMI 21.79 ± 2.40) were studied during routine

laparotomies (Table 1A and B). All emergency cases had perforation peritonitis or intestinal obstruction. All routine cases underwent surgery for malignancies of Esophagus/Pancreas/Colon.

Both groups were comparable in terms of age ($p = 0.29$), gender ($p = 0.93$) and BMI ($p = 0.47$). Mean retraction of rectus edge was significantly more in emergency group (upper part: 4.14 ± 1.36 mm vs. 2.94 ± 1.58 mm; $p = 0.0071$; middle part: 2.88 ± 1.53 mm



Figure 1 Measurement of retraction of edge of rectus sheath by electronic digital Vernier caliper.

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Table 1 Retraction of rectus edge in emergency/routine upper midline laparotomies.

No of patients	Male:female	Mean age in years	Mean BMI	Mean rectus edge retraction in mm from 10 mm mark		
				Upper	Middle	Lower
A. Emergency midline laparotomies						
N = 28	24:4	41.53	22.41	4.14	2.88	4.13
B. Routine midline laparotomies						
N = 20	18:2	46.5	21.79	2.94	1.69	3.15

vs. 1.69 ± 0.93 mm; $p = 0.0071$; lower part: 4.13 ± 1.44 mm vs. 3.15 ± 1.37 mm; $p = 0.0222$).

Tissue elasticity leads to rectus edge retraction after incision. All emergency cases had distention of abdomen due to perforation peritonitis or intestinal obstruction; explaining greater retraction in them. Presence of central tendinous intersection (located between costal margin and umbilicus) fixing rectus sheath to rectus muscle explains why more retraction occurs in upper and lower ends of incision.⁵

To our knowledge, this is the first time 'in vivo' assessment of rectus fascial changes have been made. Our observation showed that maximum retraction of rectus is about 40%; putting a question mark over the 'actual' distance of bites used for rectus closure. Practical utility of this observation on techniques of abdominal closure will require further study.

Conflict of interest

Nil.

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