

# Outcomes of laceration suture repair in the Emergency Department

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# Background:

Patients sutured in the ED usually not seen again

Previous ED studies of laceration repair have focused on:

- specific complications
- physician and patient-rated repair cosmesis

Aimed to assess:

- wound outcomes
- patient satisfaction with:
  - laceration cosmesis
  - post-ED care (wound, pain & follow up advice)
  - overall management



# Methods: Study Design

- prospective cohort study (Feb-May 2019)
- adult patients sutured in two EDs (Austin, RMH)
- ED data: demographics, laceration features, management
- 14 days post-discharge, patients were surveyed:
  - wound outcomes
  - satisfaction with:
    - cosmesis
    - pain management
    - advice on wound care and follow-up
    - overall management
- 6-item satisfaction scale (very dissatisfied to very satisfied)



# Methods: Statistics

- Original sample size 400
- Never reached:
  - Delayed start at one site
  - High proportion managed by plastic surgery
- Student's t-test for parametric continuous data
- Chi square test for comparisons of proportions
- Level of significance 0.05



# Results:

Participants meeting inclusion criteria:

- $\geq 18$  years of age
- wound requiring primary suture repair

Exclusion criteria met:

- Refused participation
- Inability to complete the follow-up survey (cognitive, illness, language)
- Repaired by plastic surgery

Eligible participants enrolled and followed-up 14 days post-ED (n=106)

Lost to follow-up (n=17)

- Declined participation (n=5)
- Uncontactable (n=12)

Completed follow-up survey  
(n=89)



# Results:

Patient and laceration characteristics	Complete data (n=89)	Incomplete data (n=17)
Age (years), mean (SD)	45.7 (21.3)	42.4 (20.0)
Gender, n (%)		
male	66 (74.2)	13 (76.5)
female	23 (25.8)	4 (23.5)
Site of laceration, n (%)		
head or neck	32 (36.0)	6 (35.4)
torso	2 (2.2)	0 (0.0)
hand	25 (28.1)	4 (23.5)
arm	11 (12.4)	3 (17.6)
leg or foot	19 (21.3)	4 (23.5)
Practitioner, n (%)		
student, intern, resident	24 (27.0)	3 (17.6)
registrar	35 (39.3)	8 (47.2)
consultant	8 (9.0)	3 (17.6)
nurse practitioner	22 (24.7)	3 (17.6)
Length of laceration (cm), mean (SD)	4.0 (2.8)	4.4 (2.7)
Number of sutures, mean (SD)	5.0 (2.9)	5.0 (2.0)



# Results:

Variable	Student, intern, resident (n=24)	Registrar (n=35)	Consultant (n=8)	Nurse Pract. (n=22)
Patient age (years), mean (SD)	50.4 (26.1)	46.0 (19.7)	47.4 (26.6)	39.6 (15.1)
Gender, n (%) male	18 (75.0)	27 (77.1)	5 (62.5)	16 (72.7)
Mechanism, n (%)				
glass	1 (4.2)	3 (8.6)	0 (0.0)	3 (13.6)
knife	1 (4.2)	2 (5.7)	3 (37.5)	3 (13.6)
wood	4 (16.7)	4 (11.4)	2 (25.0)	0 (0.0)
blunt object	10 (41.6)	14 (40.0)	1 (12.5)	3 (13.6)
other	8 (33.3)	12 (34.3)	2 (25.0)	13 (59.2)
Site of laceration, n (%)				
head or neck	11 (45.8)	17 (48.6)	4 (50.0)	0 (0.0)
torso	1 (4.2)	1 (2.8)	0 (0.0)	0 (0.0)
hand	4 (16.7)	7 (20.0)	2 (25.0)	12 (54.5)
arm	5 (20.8)	3 (8.6)	1 (12.5)	2 (9.1)
leg or foot	3 (12.5)	7 (20.0)	1 (12.5)	8 (36.4)
Length of laceration (cm), mean (SD)	4.3 (2.8)	3.9 (2.5)	4.7 (3.7)	3.4 (2.8)
Number of sutures, mean (SD)	4.8 (3.2)	4.5 (2.4)	5.9 (3.6)	5.8 (3.2)
Oral antibiotic given, n (%)	4 (16.7)	7 (20.0)	2 (25.0)	10 (45.5)
Analgesia prescription given, n (%)	3 (12.5)	5 (14.3)	1 (12.5)	1 (4.5)



# Results:

Variable	Student, intern, resident (n=24)	Registrar (n=35)	Consultant (n=8)	Nurse Pract. (n=22)
Patient age (years), mean (SD)	50.4 (26.1)	46.0 (19.7)	47.4 (26.6)	39.6 (15.1)
Gender, n (%) male	18 (75.0)	27 (77.1)	5 (62.5)	16 (72.7)
Mechanism, n (%)				
glass	1 (4.2)	3 (8.6)	0 (0.0)	3 (13.6)
knife	1 (4.2)	2 (5.7)	3 (37.5)	3 (13.6)
wood	4 (16.7)	4 (11.4)	2 (25.0)	0 (0.0)
blunt object	10 (41.6)	14 (40.0)	1 (12.5)	3 (13.6)
other	8 (33.3)	12 (34.3)	2 (25.0)	13 ( <b>59.2</b> )
Site of laceration, n (%)				
head or neck	11 (45.8)	17 (48.6)	4 (50.0)	0 ( <b>0.0</b> )
torso	1 (4.2)	1 (2.8)	0 (0.0)	0 (0.0)
hand	4 (16.7)	7 (20.0)	2 (25.0)	12 ( <b>54.5</b> )
arm	5 (20.8)	3 (8.6)	1 (12.5)	2 (9.1)
leg or foot	3 (12.5)	7 (20.0)	1 (12.5)	8 ( <b>36.4</b> )
Length of laceration (cm), mean (SD)	4.3 (2.8)	3.9 (2.5)	4.7 (3.7)	3.4 (2.8)
Number of sutures, mean (SD)	4.8 (3.2)	4.5 (2.4)	5.9 (3.6)	5.8 (3.2)
Oral antibiotic given, n (%)	4 (16.7)	7 (20.0)	2 (25.0)	10 ( <b>45.5</b> )
Analgesia prescription given, n (%)	3 (12.5)	5 (14.3)	1 (12.5)	1 ( <b>4.5</b> )





# Results:

Variable		Student, intern, resident (n=24)	Registrar (n=35)	Consultant (n=8)	Nurse Pract. (n=22)
Complications, n (%)					
	infection	3 (12.5)	0 (0.0)	1 (12.5)	1 (4.5)
	dehiscence	2 (8.3)	1 (2.9)	1 (12.5)	4 (18.2)
	suture failure	1 (4.2)	4 (11.4)	1 (12.5)	2 (9.1)
	infection/dehiscence/failure	4 (16.7)	5 (14.7)	1 (12.5)	6 (27.3)
Cosmesis:	very satisfied	10 (41.7)	21 (60.0)	3 (37.5)	12 (54.5)
	not very satisfied	14 (58.3)	14 (40.0)	5 (62.5)	10 (45.5)
Pain management:	very satisfied	12 (52.2)	27 (77.1)	6 (75.0)	10 (45.5)
	not very satisfied	11 (47.8)	8 (22.9)	2 (25.0)	12 (54.5)
Wound advice:	very satisfied	11 (45.8)	22 (62.9)	5 (62.5)	13 (59.1)
	not very satisfied	13 (54.2)	13 (37.1)	3 (37.5)	9 (40.9)
Follow-up advice:	very satisfied	6 (25.0)	18 (51.4)	3 (37.5)	12 (54.5)
	not very satisfied	18 (75.0)	17 (48.6)	5 (62.5)	10 (45.5)
Overall:	very satisfied	13 (54.2)	25 (71.4)	7 (87.5)	16 (72.7)
	not very satisfied	11 (45.8)	10 (28.6)	1 (12.5)	6 (27.3)



# Results:

Variable		Student, intern, resident (n=24)	Registrar (n=35)	Consultant (n=8)	Nurse Pract. (n=22)
Complications, n (%)					
	infection	3 (12.5)	0 (0.0)	1 (12.5)	1 (4.5)
	dehiscence	2 (8.3)	1 (2.9)	1 (12.5)	4 (18.2)
	suture failure	1 (4.2)	4 (11.4)	1 (12.5)	2 (9.1)
	infection/dehiscence/failure	4 (16.7)	5 (14.7)	1 (12.5)	6 ( <b>27.3</b> )
Cosmesis:	very satisfied	10 (41.7)	21 (60.0)	3 ( <b>37.5</b> )	12 (54.5)
	not very satisfied	14 (58.3)	14 (40.0)	5 (62.5)	10 (45.5)
Pain management:	very satisfied	12 (52.2)	27 (77.1)	6 (75.0)	10 ( <b>45.5</b> )
	not very satisfied	11 (47.8)	8 (22.9)	2 (25.0)	12 (54.5)
Wound advice:	very satisfied	11 ( <b>45.8</b> )	22 (62.9)	5 (62.5)	13 (59.1)
	not very satisfied	13 (54.2)	13 (37.1)	3 (37.5)	9 (40.9)
Follow-up advice:	very satisfied	6 ( <b>25.0</b> )	18 (51.4)	3 (37.5)	12 (54.5)
	not very satisfied	18 (75.0)	17 (48.6)	5 (62.5)	10 (45.5)
Overall:	very satisfied	13 ( <b>54.2</b> )	25 (71.4)	7 (87.5)	16 (72.7)
	not very satisfied	11 (45.8)	10 (28.6)	1 (12.5)	6 (27.3)



## Patients with Wound Infection

<b>Age (years)</b>	19	24	63	20	43
<b>Gender</b>	male	female	male	male	female
<b>Mechanism</b>	metal	knife	blunt object	angle grinder	blunt object
<b>Co-morbidities</b>	nil	nil	nil	nil	nil
<b>Site of laceration</b>	distal leg	forearm	scalp	dorsum of hand	chin
<b>Length (cm)</b>	6	10	5	1.5	3
<b>Depth</b>	subcutaneous	subcutaneous	subcutaneous	subcutaneous	subcutaneous
<b>Visible contamination</b>	no	no	no	yes	no
<b>Practitioner</b>	nurse practitioner	consultant	intern	registrar	registrar
<b>Irrigation</b>	saline	saline	saline	saline	saline
<b>Scrubbing</b>	saline	none	chlorhexidine	saline	saline
<b>Number of sutures</b>	8	6	4	3	3
<b>Prophylactic antibiotics</b>	no	no	no	no	no
<b>Other complications</b>	nil	dehiscd (1.5cm) 1 suture untied	nil	dehiscd 1 suture untied	nil
<b>Cosmesis satisfaction</b>	very satisfied	satisfied	very satisfied	sl. dissatisfied	sl. satisfied
<b>Overall satisfaction</b>	very satisfied	very satisfied	very satisfied	very satisfied	satisfied
<b>Comments</b>	“Dressing dirty at work, took it off and left my sock over it”	nil	nil	“All my own fault: going to work too soon and not seeing GP care afterwards”	nil



## Patients with Wound Infection

Age (years)	19	24	63	20	43
Gender	male	female	male	male	female
Mechanism	metal	knife	blunt object	<b>angle grinder</b>	blunt object
Co-morbidities	nil	nil	nil	nil	nil
Site of laceration	<b>distal leg</b>	forearm	scalp	dorsum of hand	chin
Length (cm)	6	10	5	1.5	3
Depth	subcutaneous	subcutaneous	subcutaneous	subcutaneous	subcutaneous
Visible contamination	no	no	no	<b>yes</b>	no
Practitioner	nurse practitioner	consultant	intern	registrar	registrar
Irrigation	saline	saline	saline	saline	saline
Scrubbing	saline	none	chlorhexidine	saline	saline
Number of sutures	8	6	4	3	3
Prophylactic antibiotics	no	no	no	no	no
Other complications	nil	dehiscd (1.5cm) 1 suture untied	nil	dehiscd 1 suture untied	nil
Cosmesis satisfaction	very satisfied	satisfied	very satisfied	sl. dissatisfied	sl. satisfied
Overall satisfaction	very satisfied	very satisfied	very satisfied	very satisfied	satisfied
Comments	<b>“Dressing dirty at work, took it off and left my sock over it”</b>	nil	nil	<b>“All my own fault: going to work too soon and not seeking GP care afterwards”</b>	nil



# Results:

variable	very dissatisfied	dissatisfied	slightly dissatisfied	slightly satisfied	satisfied	very satisfied
Cosmetic appearance, n (%)	0 (0.0)	3 (3.4)	4 (4.5)	5 (5.6)	31 (34.8)	46 (51.7)
Pain management*, n (%)	1 (1.1)	1 (1.1)	1 (1.1)	4 (4.6)	26 (29.5)	55 (62.6)
Wound care advice, n (%)	0 (0.0)	2 (2.3)	2 (2.3)	5 (5.6)	29 (32.6)	51 (57.2)
Follow-up advice, n (%)	0 (0.0)	3 (3.4)	3 (3.4)	3 (3.4)	41 (46.0)	39 (43.8)
Overall management , n (%)	0 (0.0)	0 (0.0)	4 (4.5)	2 (2.3)	22 (24.7)	61 (68.5)

\*n=88



# Results:

		very satisfied with overall m'ment		
variable		yes (n=61)	no (n=28)	p
Age (years), mean (SD)		48.5 (21.3)	39.8 (20.4)	0.07
Gender, n (%)	male	47 (71.2)	19 (28.8)	0.36
	female	14 (60.9)	9 (39.1)	
Mechanism, n (%)	glass	5 (71.4)	2 (28.6)	na <sup>†</sup>
	knife	7 (77.8)	2 (22.2)	
	wood	6 (60.0)	4 (40.0)	
	blunt object	19 (67.9)	9 (32.1)	
	other	24 (68.6)	11 (31.4)	
Site, n (%)	head or neck	22 (68.7)	10 (31.3)	na <sup>†</sup>
	torso	2 (100.0)	0 (0.0)	
	hand	14 (56.0)	11 (44.0)	
	arm	9 (81.8)	2 (18.2)	
	leg or foot	14 (73.7)	5 (26.3)	
Length of laceration (cm), mean (SD)		4.1 (2.7)	3.7 (2.9)	0.58
Number of sutures, mean (SD)		5.2 (3.0)	4.8 (2.9)	0.59
Oral antibiotics, n (%)	yes	17 (73.9)	6 (26.1)	0.52
	no	44 (66.7)	22 (33.3)	

<sup>†</sup>Numbers too small



# Results:

variable	very satisfied with overall m'tment		p
	yes (n=61)	no (n=28)	
Very satisfied with wound cosmesis, n (%)			
yes	41 (89.1)	5 (10.9)	<0.001
no	20 (46.5)	23 (53.5)	
Very satisfied with pain management, n (%)			
yes	51 (92.7)	4 (7.3)	<0.001
no	9 (27.3)	24 (72.7)	
Very satisfied with wound care advice, n (%)			
yes	48 (94.1)	3 (5.9)	<0.001
no	13 (34.2)	25 (65.8)	
Very satisfied with follow-up advice, n (%)			
yes	39 (100.0)	0 (0.0)	<0.001
no	22 (44.0)	28 (56.0)	
Infection, dehiscence and/or suture failure, n (%)			
yes	11 (68.7)	5 (31.3)	0.96
no	49 (68.1)	23 (31.9)	



# Conclusion:

- Undesirable outcomes (e.g. infection) uncommon
- Most patients are satisfied with their ED management
  - associated cosmesis, pain management and advice
  - *not* associated with undesirable outcomes
- Practitioner subgroups differ little:
  - nurse practitioners – antibiotics and analgesia
  - junior staff lowest satisfaction
- Most scope for improvement:
  - follow-up
  - wound care advice

