

Critical Review Form

Meta-analysis

Absorbable Versus Nonabsorbable Sutures in the Management of Traumatic Lacerations and Surgical Wounds: A Meta-Analysis, *Ped Emerg Care* 2007; 23: 339-344

Objective: To evaluate “RCTs that compare the cosmetic outcomes and complications of traumatic lacerations and surgical incisions closed with absorbable sutures versus non-absorbable sutures”. (p. 359)

Methods:

Investigators conducted electronic searches of [MEDLINE](#) (January 1966 to July 2004), EMBASE (January 1988 to July 2004), and the Cochrane Wounds Group Specialized Trial Register were conducted using the following terms: laceration, wounds, incision, skin abrasion, absorbable, non-absorbable, polybutester, monofilament, multifilament, polyfilament, synthetic, nonsynthetic, braid, non-braid, polyethalone, polydioxanone, PDS, polyglactic, vicryl, polyglycolic, nylon, ethilon, polypropylene, prolene, catgut, chromic, polyglyconate, maxon, silk, dermalon, surgilene, ethibond, ethiflex, dacron, and novafil. Additionally one reviewer searched the bibliography databases and reviewed the reference list of selected articles. Included studies had to be randomized controlled trials evaluating absorbable vs. non-absorbable sutures in the ED, outpatient clinic or operating room. Non-English studies were included and there were no restrictions based upon subject age or wound location.

Study quality was assessed using the [Jadad score](#) (0= poor quality, 5= high quality). Data were extracted by one reviewer to standardized forms then checked for accuracy by a second reviewer. [Heterogeneity](#) was assessed using Cochrane’s Q (χ^2) test. Studies were pooled using a random-effects model. Continuous outcomes were expressed as weighted mean difference (WMD) while dichotomous outcomes were expressed as odds ratios. *A priori* subgroup analysis was planned for wound laceration (face vs. body) as well as extent/type of laceration. Sensitivity analysis (role of funding source, methodological quality and loss to follow-up) was also planned but not reported.



Guide	Question	Comments
I	<i>Are the results valid?</i>	
1.	Did the review explicitly address a sensible question?	Yes. Can absorbable sutures be used in place of non-absorbable sutures without compromising patient outcomes? (wound healing, infection rate, etc.)
2.	Was the search for relevant studies details and exhaustive?	Yes, although the investigators could have conducted hand-search of scientific abstracts and contacted experts in the field (academia and industry) to identify unpolished sources of data.
3.	Were the primary studies of high methodological quality?	No. “None of the studies were double-blinded because of the nature of the interventions (i.e., it is impossible to insert placebo sutures), thus Jadad quality scores ranged from 1 to a maximum of 3. All studies had unclear allocation concealment, and only 2 studies reported funding sources”. (p. 341) This analysis by the authors is inadequate since patients and suturing clinicians could have been theoretically blinded by simply handing them identical appearing suture and having all subjects follow-up within a pre-specified time for suture removal.
4.	Were the assessments of the included studies reproducible?	Uncertain, although study quality was assessed by two reviewers, no measurement of reproducibility (Kappa) was reported.
II.	<i>What are the results?</i>	

1.	What are the overall results of the study?	<ul style="list-style-type: none"> • All studies were identified by the electronic search of MEDLINE and EMBASE including 338 citations with 24 selected as possible relevant and 7 ultimately included in the meta-analysis (total 702 subjects). • The studies included assessed the following outcomes: wound cosmetic appearance (2), scar hypertrophy (3), wound infection (7), wound dehiscence (2), redness (3), swelling (2), and patient satisfaction. <p><u>Cosmetic Outcome</u></p> <ul style="list-style-type: none"> • Studies used the WES or the CVAS to measure this outcome. • No differences were noted in short-term (OR 1.71; 95% CI 0.75 – 3.86) or long-term (OR 1.43, 95% CI 0.49 – 4.20) using the dichotomous outcome good outcome WES = 6, bad outcome = any other WES. • Similarly, when using the CVAS no differences were noted in long-term outcome (WMD 5.1; 95% CI - 0.37 to 1.94). • Tests for long-term cosmetic outcome demonstrated heterogeneity likely reflecting different study designs (5-month vs. 12-month follow-up). <p><u>Scar hypertrophy</u></p> <ul style="list-style-type: none"> • No difference noted (OR 0.80, 95% CI 0.26 – 2.42) <p><u>Wound Dehiscence</u></p> <ul style="list-style-type: none"> • No difference noted (OR 0.16, 95% CI 0.02 – 1.45) <p><u>Wound Infection</u></p> <ul style="list-style-type: none"> • Among all lacerations, no difference noted (OR 1.00, 95% CI 0.39 – 2.56) • Among traumatic lacerations, no significant difference noted (OR 0.42, 95% CI 0.07 – 2.51) <p><u>Swelling or Edema @ Wound Site</u></p> <ul style="list-style-type: none"> • No significant difference (OR 1.18, 95% CI 0.50 – 2.80) • None of the selected studies reported pain at the time of suturing, the ease of suture placement, or patient satisfaction during the procedure. • Given the small number of studies neither the pre-planned subgroup analysis nor the evaluation for publication bias were conducted.
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2.	How precise are the results?	The above 95% CI cross the line of equivalence for all outcomes.
3.	Were the results similar from study to study?	Except for long-term cosmesis no statistically significant heterogeneity was detected, however χ^2 under-powered to detect between-study heterogeneity and no I^2 analysis was conducted.
III.	<i>Will the results help me in caring for my patients?</i>	
1.	How can I best interpret the results to apply them to the care of my patients?	A small number of low quality RCTs with heterogeneous designs and outcomes suggest that non-absorbable sutures are equivalent to absorbable sutures for short and long-term wound cosmesis, infection and dehiscence rates and post-repair swelling.
2.	Were all patient important outcomes considered?	“None of the selected studies reported pain at the time of applying the suture, the ease of suture placement, or patient satisfaction during the procedure”. (p. 343) Furthermore, no studies assessed discomfort or angst during suture/removal which may be a significant and unnecessary stressor in children.
3.	Are the benefits worth the costs and potential risks?	No cost-benefit analysis was conducted. However, the authors reference an economic analysis (Osmond 1995) suggesting that tissue adhesives were most cost-effective, but the absorbable suture had \$30 (Canadian \$1993) savings per patient compared with non-absorbable sutures. This analysis assumed that ED overhead expenses, ED visit registration, and school/work time lost were equivalent.

Limitations

- 1) Failure to reference or completely follow the [QUOROM](#) guidelines.
- 2) [Incomplete search strategy](#) (primarily for gray, unpublished data).
- 3) Incomplete assessment for [heterogeneity](#), (χ^2 result not reported and I^2 assessment not conducted).
- 4) No assessment for publication bias.
- 5) None of the studies were appropriately powered to test [equivalence](#).

Bottom Line

Based upon 7 RCT's (enrolling a total of 702 patients) absorbable sutures appear to be equivalent to non-absorbable sutures for traumatic and non-traumatic wound repair with no significant difference in short- or long-term wound cosmesis, dehiscence or infraction rates. Future

appropriately powered pragmatic clinical trials should confirm these findings while assessing cost-effectiveness and actual patient/parent discomfort with suture removal.



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