

Techniques for wound closure at caesarean section: a randomized clinical trial

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ABSTRACT

Objective: It is unclear which technique for skin closure should be used at caesarean section (CS) in order to get the best cosmetic result.

Study design: We conducted a randomized controlled trial to assess the cosmetic result of different techniques for skin closure after CS. A two-center single-blind randomized controlled trial was performed in The Netherlands. Women undergoing their first CS were eligible for the trial. In a factorial design, women were randomly allocated to (1) closure of the fat layer versus non-closure and (2) staples or intracutaneous stitches for skin closure. The cosmetic result was assessed using the Patient and Observer Scar Assessment Scale (POSAS).

Results: We included 124 women. In the stitches group 63% [39/62] women judged the scar as satisfactory, versus 63% [38/60] in the staples group (RR 1.01; 95% CI 0.64–1.6). When the subcutaneous fat layer was closed, 52% [33/63] of the women scored the scar as satisfactory, versus 75% [44/59] of the women in whom the fat layer was not separately closed (RR 0.53; 95% CI 0.32–0.89). This effect was independent of the subcutaneous thickness (*p*-value for interaction 0.64). Of the secondary outcomes, subcutaneous closure of the fat layer was associated with a longer admission time (median 4 days; IQR 3–5 versus 3 days; IQR 3–5, *p*-value 0.023).

Conclusions: The choice of staples or stitches does not affect the cosmetic result after a caesarean section. Closing of the subcutaneous fat layer, however, negatively affects the cosmetic result and is associated with a longer admission time.

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1. Introduction

Caesarean section (CS) is the most common major operation performed on women worldwide [1]. A variety of techniques has been described for closing the wound after a Pfannenstiel incision. A Cochrane systematic review showed that there is no conclusive evidence about how the skin should be closed after CS [2].

The main debate about skin closure at CS is between closure with staples and subcuticular stitches, in respect to cosmetic appearance. Recently, several randomized controlled trials addressing this issue have been published, with conflicting conclusions. Some studies reported no statistically significant differences [3,4], where others found staples to be the method of choice [5]. In contrast, there are other randomized studies that showed that the use of subcuticular stitches is the superior choice [6,7]. Two recent meta-analyses suggested a possible benefit on wound complications with subcuticular stitches compared to staples for skin closure at CS [8,9], but Clay et al. [8] still concluded that the optimal

skin closure technique at CS demands further study. Most studies included in these meta-analyses addressed the issue of wound complications, whereas only two studies included other useful outcomes measures such as wound appearance, patient satisfaction and pain scores [3,5]. Rousseau et al. [5] reported that pain at 6 weeks postoperatively was significantly less in the staple group (*p* = 0.04). No difference was noted for scar appearance and women's satisfaction. Cromi et al. [3] reported that in the wound repair of a CS, stapled wounds and those closed with subcuticular sutures resulted in equivalent cosmetic appearance of the scar.

In summary, since there seems to be no evident benefit to use a particular skin closure technique, the method of choice currently seems to depend on the personal preference of the operator. A survey among obstetricians in the United Kingdom showed large variation in skin closure techniques [1]. The aim of the present study was to investigate the effect of wound closure techniques on the cosmetic appearance of the scar.

2. Patients and methods

2.1. Design

This was a two-center single-blind randomized controlled trial performed in The Netherlands. Patients were randomized to two

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interventions in a factorial design (both 1:1). The study was approved by the Ethical Committee of the Spaarne Hospital (registration number: 2005/205) and registered in the international clinical trial register (ISRCTN: 54855822).

2.2. Participants

Women older than 18 years undergoing a first caesarean delivery were eligible for the trial. Women with a previous abdominal operation, diabetes or signs of infection during delivery were excluded. The study was performed in the Spaarne Hospital in Hoofddorp and the Academic Medical Center in Amsterdam, The Netherlands. All patients gave written informed consent prior to participation.

2.3. Interventions

We used a factorial design with two comparisons of two interventions, which meant that each patient was randomized twice, to: (1) closure versus no closure of the subcutaneous fat layer, and (2) skin closure with staples versus intracutaneous skin closure. So 2×2 groups were created: (1) no closure of the

subcutaneous fat layer and skin closure with staples; (2) no closure of the subcutaneous fat layer and intracutaneous skin closure; (3) closure of the subcutaneous fat layer with stitches and skin closure with staples; and (4) closure of the subcutaneous fat layer with stitches and intracutaneous skin closure.

The CS was performed with a Pfannenstiel incision under a spinal anesthetic. Closure of the subcutaneous fat layer was performed with five interrupted subcutaneous stitches using Vicryl 2.0. Suture of the skin was performed with Monocryl 3.0, as a monofilament suture (e.g. Monocryl) compared with a multifilament suture (e.g. Vicryl-rapide) in skin closure gives significantly smaller, less reactive scars with a lower tendency toward hypertrophic scar formation [10]. The wound was dressed with gauze, and adhesive strips were not used. All women received antibiotic prophylaxis after delivery of the baby. Postoperatively women were mobilized beginning on the day of the operation, and received thromboprophylaxis with low-molecular weight heparin daily until discharge. When staples were used, the clips were removed on the 7th postoperative day. We emphasized in a letter to the outpatient healthcare provider the importance for the study, of staple removal on the 7th postoperative day.

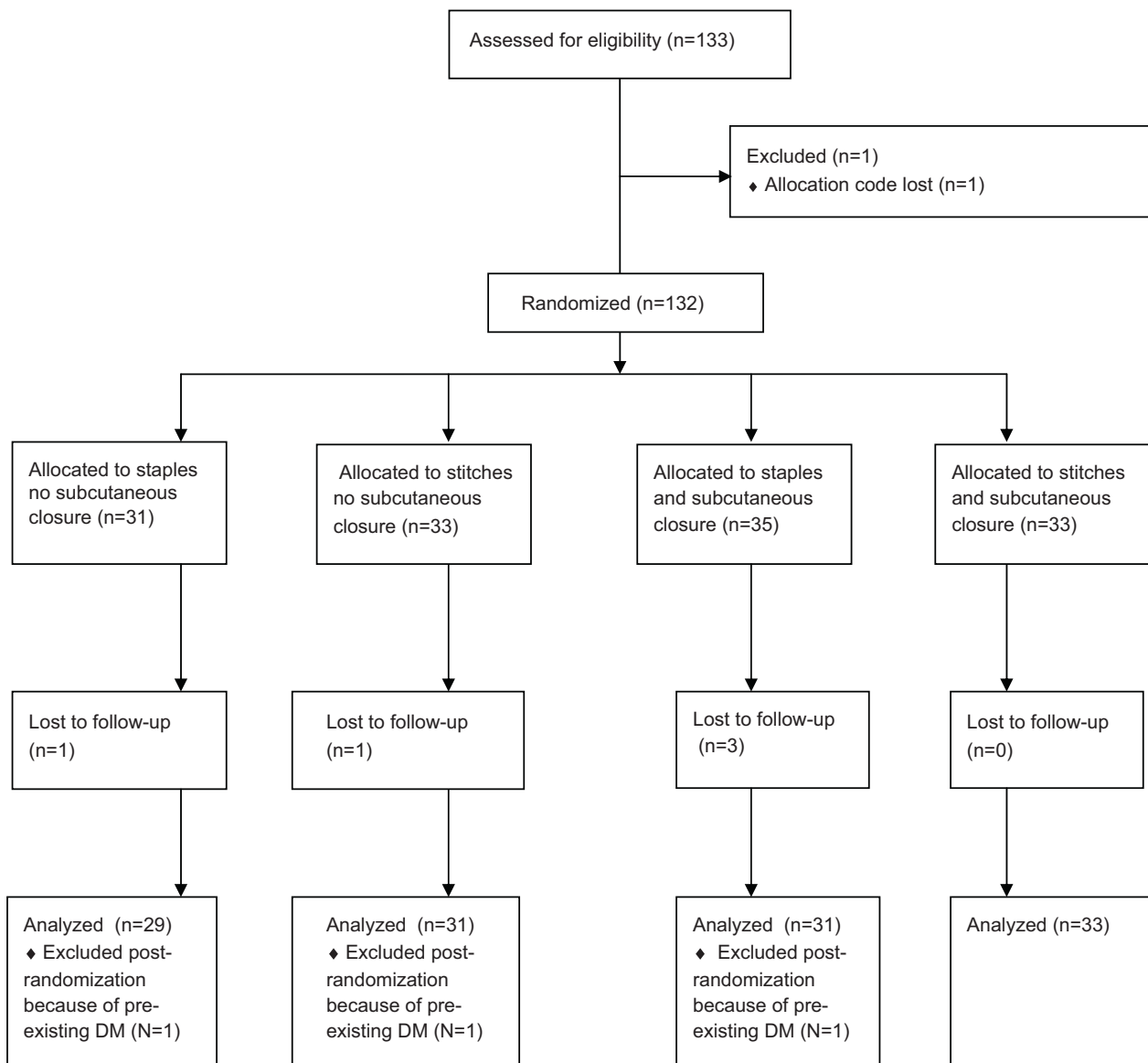


Fig. 1. CONSORT 2010 flow diagram.

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