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# Hypertrophic Cesarean Section Scarring: Polyglycolic acid and Nylon Sutures in a Randomized Trial

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**ABSTRACT**

**Objective** To compare the incidence of hypertrophic scar between polyglycolic acid (PGA) and nylon sutures in cesarean section.
**Design** Prospective study.
**Setting** Department of Obstetrics and Gynecology, Faculty of Medicine, Ramathibodi Hospital, Mahidol University.
**Subjects** In 62 patients undergoing primary cesarean section, 32 patients were closed with subcuticular PGA suture and 30 patients were closed with interrupted nylon suture.
**Main outcome measures** Measurements of the hypertrophic scar was made at 6 months after surgery.
**Results** Thirty-two of the 32 patients (100 percent) closed with subcuticular PGA suture and sixteen of the 30 patients (53 percent) closed with interrupted nylon showed hypertrophy.
**Conclusion** The use of PGA suture subcuticularly has higher incidence of hypertrophic scarring in cesarean section wound than that use of nylon suture interruptedly.

**Key words:** Hypertrophic Scar, Cesarean Section, Polyglycolic acid, Nylon

Dexon is a synthetic, absorbable suture made by the polymerization of glycolic acid (PGA). The tensile strength, knotting properties and handling characteristics have been found to be satisfactory and surgeons from several specialties have used the material successfully in clinical practice.[1-5] Many authors[6,7] reported the use of PGA subcuticularly in wound closurewith an increased incidence of hypertrophic scar formation. We now report a randomized prospective trial on the incidence of hypertrophy in cesarean section wound healing and on the importance of the type of the suture material in the production of scarring.

## Materials and Methods

Two methods of skin closure have been compared in primary cesarean section wound (Pfannenstiel and low midline incisions): subcuticular 2-0 PGA suture and transverse interrupted 0 nylon sutures. A consecutive series of 62 patients undergoing primary cesarean section gave informed consent to be randomly allocated to one of the two

skin closure groups. The deep layers of all wounds were closed identically with continuous 2-0 chromic catgut to the peritoneum, continuous 0 PGA suture to the rectus sheath and interrupted 2-0 chromic catgut to the subcutaneous tissue.

A form was completed for each patient, age and hemoglobin concentrations were recorded. Measurements of the wound was made at 6 month after surgery. The width of the scar was measured with a calliper and an attempt then made to compress the tissue between the points placed on the edges of the scars. Scars were said to be hypertrophied when they were raised above the surrounding skin, and incompressible when the points of the calliper could not be brought together.

The data were analysed by a standard method described by Armitage.[8] The results were expressed as parameters for the main factors influencing the proportion of hypertrophied wounds. Each parameter represents the change in the natural logarithm of the odds on hypertrophy being caused by the corresponding factor. One level of each factor was absorbed into the general mean and did not appear in the analysis.

**Table 1.** Patient characteristics for each of the suture groups

| | **Subcuticular PGA** | **Interrupted Nylon** |
|---|---|---|
| No of patients | 32 | 30 |
| Mean age (yr) | 31.8±10 | 29.0±8 |
| Mean Hb (g/dl) | 11.0±6 | 12.2±3 |

**Table 2.** Number and percentage of patients with hypertrophic scars

| | **Subcuticular PGA** | | | **Interrupted Nylon** | | | **P-value** |
|---|---|---|---|---|---|---|---|
| | | **Hypertrophy** | | | **Hypertrophy** | | |
| **Incision** | **No** | **No** | **%** | **No** | **No** | **%** | |
| Low midline | 26 | 26 | 100 | 16 | 8 | 50 | |
| Pfannenstiel | 6 | 6 | 100 | 14 | 8 | 57 | |
| Total | 32 | 32 | 100 | 30 | 16 | 53 | <0.05 |

Significant level: P<0.05

## Results

Of the 80 who entered, 62 patients (78 percent) complete the trial. Characteristics of the patients in each of the two groups are recorded in Table 1 and show that the groups are comparable. Forty-eight patients (77 percent) had hypertrophic scar formation, which was often segmental. The hypertrophy affected over two-thirds of the wounds in 16 patients (33 percent) and less than one-third in 6 patients (13 percent). The worst example of hypertrophy was in a low midline wound which was a 9 mm. wide. More commonly hypertrophic segments were 3 or 4 mm wide, compressible by 1 or 2 mm and pink in colour.

Thirty-two of the 32 wounds (100 percent) closed with subcuticular PGA suture showed hypertrophy (Table 2), an incidence significantly in excess of that

seen with interrupted nylon (53 percent) ($P<0.05$). This hypertrophy was not dependent on the type of skin incision both subcuticular PGA suture and interrupted nylon.

## Discussion

The cosmetic quality of cesarean section scar is less important to the surgeon than dehiscence and herniation and in a busy outpatients department, the patient's opinion of the scar is rarely sought. We have found that (after straightforward cesarean section) three-fourth of the wounds will show some degree of hypertrophy irrespective of the suture used. This is in keeping with the published results of Arabi and Alexander-Willims,[9] but using a stratified randomization and a statistical analysis designed for such a multifactorial situation, this risk is significantly increased if PGA is inserted subcuticularly to close the skin. However, we do agree with Jones and Shorey[10] that PGA suture has advantages since their patients said they were apprehensive of suture removal, and avoiding suture removal saves nursing time. However, this study failed to confirm the effect of the type of the skin incision, although there were trends in the expected direction.

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