

The Outcomes of Two Different Suturing Constituents [Chromic Catgut and Polyglycolic Acid (Dexon)] in Episiotomy Repairing

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Abstract

Episiotomy is definite as a perineum surgical incision used during childbirth for increasing vulval outlet diameter. Different kinds of suture constituents are used for episiotomy suturing, commonly used ones are polyglycolic acid (Dexon) and chromic catgut (CC). The purpose of the current work is for comparing the consequences of using the two sutures constituent's (Dexon) and CC. This study was performed at the Teaching Hospital of Al-Elwiya Maternity and some private hospitals between January 2021 and June 2022. This study is performed through prospective double control study. A total of 150 laboring women with a mean age of 25 years were randomly selected. They were distributed into 2 groups: the 1st one (A) is of 75 women their episiotomies were sutured by Dexon and the other 75 women (group B) their episiotomies were sutured by CC. The women in the hospital observed for the 1st 24 h (haematoma and swelling), 7-10 days postpartum (haematoma, swelling, pain, healing, discharge, wound dehiscence and infection) with one week cover of antibiotics without the use of prophylactic antibiotics, then after puerperium within 6 months, they came back to the hospital in two visits (dyspareunia ,fistula, and stitch removal). P-value ≤ 0.05 was regarded significant statistically.

At first 24 h, there were no significant statistical differences detected between the 2 groups, while at 7-10 days postpartum, three significant statistical differences were noticed between the two groups, including pain, healing, and discharge. Less infection rate with Dexon suturing but were not statistically significant. But from 6 weeks- 6 months postpartum no significant statistical differences was observed between the 2 groups.

In conclusion we demonstrated that (Dexon) seems to elicit less postpartum discomfort (pain, dyspareunia), good healing, less discharge, less infection rate when it is compared with CC and there is no need for the late stitch removal.

Keywords: suturing, Dexon, chromic catgut, episiotomy.

Introduction

Episiotomy is a perineum and vaginal wall incision for enlarging the vaginal opening and facilitates the birth ⁽¹⁾. An episiotomy might be categorized into 2 kinds: median (or midline) and mediolateral ⁽²⁾. Not all pregnant women need an episiotomy and assist the tissues to be stretched naturally might minimize the procedure need. When an episiotomy is not executed, perianal tissues tearing might or might not take place. An episiotomy might be utilized to help in the following treatment cases: distress of fetal, birth complication i.e., presentation of breech or dystocia of shoulder, delivery delay, vacuum or forceps delivery, baby as large and preterm, preceding surgery as pelvic floor, inelastic or short perineum and malposition of fetus ⁽²⁾. The benefits of episiotomy are: prevention of maternal lacerations ⁽³⁾, pelvic relaxation prevention and its sequel ⁽⁴⁾ and prevention of fetal injury ⁽⁵⁾. An episiotomy might be done as a vaginal birth part. The episiotomy type and procedure might differ based on the condition of women and the practices of physician ⁽⁶⁾.

The suture purpose is together holding a wound in a right apposition till the process time of natural healing is adequately well recognized for making the backing from the suture constituent redundant and unnecessary. The suture choice depends on: suture constituent properties, rate of absorption, characteristics of handling and knotting characters, suture size and needle type ⁽⁷⁾. There are two kinds of sutures:

1. Suture constituents as natural: can be absorbed (chromic or plain catgut) and cannot be absorbed (linen, silk).
2. Suture constituents as synthetic: can be absorbed polyglactin (Vicryl), polyglyconate (Maxon), (Dexon), polydioxone (PDS), and cannot be absorbed polyester (Dacron), (polyamide (Nylon), polypropylene (Prolene) ^(7,8).

The purpose of the current work is for comparing the consequences of using the two suture constituents (Dexon) and CC regarding: Haematoma, Swelling, Pain, Infection, Healing, Discharge, Wound dehiscence, Dyspareunia, Granulation tissue, Fistula and Stitch removal.

Methodology

Patients and methodology: the current work was a double prospective control study and was performed at Al-Elwiya Maternity Teaching Hospital and some private hospitals with the cooperation of the hospital directors and all doctors of the hospital. Between January 2021 and June 2022, 150 labouring women who had episiotomy during labour were included in the study; the studied women were distributed into 2 groups:

- Group A – covers 75 pregnant women whose episiotomies were sutured utilizing CC -0- suture.
- Group B – includes 75 women whose episiotomies were sutured by Dexon -0- suture.

History was taken from the women (name, age, parity, previous operations, associated diseases and socioeconomic state) and after vaginal delivery under the effect of local anaesthesia (local infiltration of 1% lignocaine) their episiotomy was sutured by interrupted transcutaneous sutures for the closure of perianal skin. Antibiotics were offered to all women utilizing (Metronidazole and Cephalosporin) for 7 days without using prophylactic antibiotics. Participated Women remained after delivery in the hospital for the 1st 24 h, and examination was done for whichever swelling and haematoma. For the next 7-10 days they were followed at the Maternity Hospital to check for pain, bowel motion and the use of analgesia, and were examined for haematoma, swelling, discharge and infection, healing and wound dehiscence. Within 6 week – 6 month postpartum, through two visits in the Maternity Hospital, women were asked about dyspareunia with inspection of perineum for the residual suture constituent evidence, and presence of fistula (rectovaginal fistula).

Statistical analysis: The findings were presented as number, percent, M^+SD . The data were analyzed by contingency coefficient taken $p\text{-value} \leq 0.05$ as statistically significant and a comparison was shown between the two suture constituents (Dexon and CC).

Results

A sum of 150 women was covered with a 25 years as mean age. There was no statistically significant difference in characteristics and no difference in the outcome if assessed for degree of laceration, maternal age, parity, presence of tear, previous episiotomy, whether antibiotic is used regularly or not and associated diseases (diabetes mellitus, hypertension, chronic infection and anaemia) as shown in table (1). They were two groups:

- Group A: 75 (50%) were allocated to (Dexon) number (0).
 - Group B: 75 (50%) were allocated to CC number (0).
1. Follow up at first 24 h: It has been found that only one woman in group A and one woman in group B had developed haematoma during the first 24 hours, $p\text{-value} > 0.05$, so there was no statistically significant difference between the two groups. Also one woman in group A and one woman in group B had developed swelling with no statistically significant difference between the two groups. (As shown in table 2).
 2. Follow up at 7- 10 days: Regarding haematoma, no women in the two groups developed haematoma. One woman in group A and (4) women in group B developed swelling, with $p\text{-value} > 0.05$. Although it was statistically not significant but the incidence of swelling was less in group A. (as shown in table 3). In addition to that there was a statistically significant difference in pain at the site of episiotomy, 12, 28 women had developed pain requiring analgesic in group A and group B respectively, as shown in table (3) , with $p\text{-value} < 0.05$. There was no statistically significant difference between the two groups in developing infection. (11, 16 women had

developed infection in group A and group B respectively, with $p\text{-value} > 0.05$), but women with Dexon had less incidence of developing infection than women sutured with CC. There was a statistically significant difference between the two groups in wound healing (68, 46 women were with good healing in group A and group B respectively, with $p\text{-value} < 0.05$) as shown in table (3), which means that with Dexon the healing was better than with CC. In addition there was a statistically significant difference between the type of suture constituents and the presence of vaginal discharge (7, 28 women developed discharge in group A and group B respectively) as shown in table (3), $p\text{-value} < 0.05$.

3. Follow up at 6 wks -6 mths: At 6 weeks- 6 months postpartum, there was no statistically significant difference between the two groups in developing dyspareunia (8, 11 subjects in group A and group B had developed dyspareunia respectively), $p\text{-value} > 0.05$, but the incidence of dyspareunia was less in those with Dexon than those with CC, as shown in table (4). No one in the two groups had developed fistula (rectovaginal), wound dehiscence and no one had required stitch removal during the follow up period.

Table (1) Women characteristics

Characteristics	Mean	
	CC	Dexon
Age	25.1	25.07
Parity	1.19	1.20
Gestational age	0.08	0.07
Associated diseases	38.31	38.22
Previous AP	0.01	0.01
Previous episiotomy	0.13	0.14

Table (2) Follow up during first 24 hours

Follow up (first 24 hours)	Haematoma 1		Swelling 1	
	No	Yes	No	Yes
Dexon	74	1	74	1
CC	74	1	74	1
Total	148	2	148	2
<i>p-value</i>	> 0.05		> 0.05	
Number of valid cases	150		150	

Haematoma 1 = Haematoma during first 24 hours.

Swelling 1 = Swelling during first 24 hours

Table (3) Follow up during 7-10 days

Follow up during 7-10 days	Swelling 2		Pain		Infection		Healing		Discharge	
	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Dexon	74	1	63	12	64	11	7	68	68	7
CC	71	4	47	28	59	16	29	46	47	28
Total	145	5	110	40	123	27	36	114	115	35
<i>p-value</i>	>0.05		<0.05		>0.05		<0.05		<0.05	
Number of valid cases	150		150		150		150		150	

Swelling 2 = Swelling during 7-10 days

Table (4) Following up during 6 wks -6 mths

Following up during 6 wks -6 mths	Dyspareunia	
	No	Yes
Dexon	67	8
CC	64	11
Total	131	19
<i>p-value</i>	>0.05	
Number of valid cases	150	

Discussions:

Current texts of American obstetric continue asserting that episiotomy stops lacerations as perianal ⁽³⁾. Gjerdingen and Glazener *et al* found that morbidity as maternal follow the birth is a problematic that its extent has been only stated in the previous decade ^(9, 10). However, it is vital that suture being absorbable might be utilized for closure, sutures as polyglycolic are favored compared to CC for their stretchy strength, non-allergic characteristics, lower infections probability, difficulties and breakdown episiotomy, catgut as chromic is a suitable alternate, nonetheless is not epitome ⁽¹¹⁾. Obstetrics, J. Whitridge Williams, in 1903 (the 1st Ed.) of his book stated that silk worm gut complemented by catgut were epitome for vaginal lacerations repairing. After 100 years later, for a lot of, catgut as chromic rests the standard, but the newer suture constituent's introduction increases the question as if such standard is quiet suitable or not ⁽¹²⁾. Suture as absorbable synthetic constituents have been presented and have theoretical benefits compared to the older products as catgut, since the newer constituents are synthetic, no necessity is there for involving animal tissues that can minimize the costs and might minimize the potential in theory for infections as zoonotic include prion strain causing bovine spongiform encephalopathy in cattle

⁽¹³⁾. Therefore, the suturing constituent type utilized for perianal repairing following birth might have an influence on the pain amount and dyspareunia as superficial practiced by women ⁽¹⁴⁾. Customarily, such selections have been directed more by expert and habit opinion than proofs. The suture constituent's spectrum for perianal repairing including several absorbable sutures kinds: catgut as chromic, polyglactin (Vicryl) and Dexon⁽¹⁵⁾. Catgut is made from healthy mammal's collagen derivative and it was stated by Irvin that catgut causes a response of inflammation in the tissues because of the fact that it is broken by phagocytosis and proteolytic enzymes ⁽¹⁶⁾. Lawire *et al*, Echerverria and Jimenez postulated that catgut is very unstable and unpredictable constituent but is rapidly absorbed and CC is treated i to slowing down the process of digestion and decline the reaction of inflammation ^(17, 18). The synthetic constituents of Vicryl and Dexon are reported to have less reaction for the tissue than CC since they are absorbed through hydrolysis but are more slowly absorbed. However, Craig *et al* reported that the total polyglactin absorption rate was considered to be shorter than Dexon 90 versus 120 days ⁽¹⁹⁾. The fresher polyglycolic suture constituents physiologically produce less response of inflammation compared to CC and hence it was assumed that the synthetic constituents utilize in episiotomy repairing could convert into minimized post-partum pain ⁽¹⁹⁾. For the reason that synthetic constituents might have longer rates of degradation, few have anxious that synthetic residual suture constituent have the potential of causing difficulties for women for weeks following their episiotomies healing and probably serve as an infection nidus ⁽²⁰⁾. Such hypotheses were examined in many randomized experiments by comparing absorbable synthetic and catgut suture constituent for perianal repairing revised by Kettle and Johnson's for the Cochrane data base in 2001, include 8 randomized trials which compared constituents of catgut suture with synthetic absorbable and for perianal repairing, that are: (Beard *et al*, Livingstone *et al*, Rogers, Banninger *et al*, Robert, Olah, Mahomed, Mackrodt) ⁽²¹⁾. Trials as 6 of 8 compared Dexon against CC for perianal repairing, Mackrodt, compared (Vicryl) to CC ⁽²²⁾ and Livingstone compared Dexon to plain catgut ⁽²³⁾. In spite of these trials another study was performed by a group of midwives in Australia comparing polyglycolic sutures Dexon with CC, also another two data one from Ipswich childbirth study and another data by (ACOG) which compared polyglactin (Vicryl) versus CC. The chief measures as outcome in these studies including a pain of short term, suture constituent removal, dehiscence being extensive, re-suturing, pain of long term and dyspareunia being superficial. The evidence in Cochrane data base specifies that the utilize of Vicryl and Dexon for perianal repairing after birth is connected with less pain as short term (in the first week post-partum) among repaired women with synthetic absorbable sutures compared with CC and was statistically significant, nonetheless is connected with increased suture removal rates compared to than CC ⁽²¹⁾. Mahomed and Mackrodt in their studies found increased necessity for synthetic absorbable suture removal

throughout the 1st 3 months^(22, 24). The documents from Ipswich birth study confirmed that women significantly experienced less pain in the immediate post-partum period if their episiotomies were Dexon-repaired⁽²²⁾. Data which was collected by a group of midwives in Australia demonstrate reduced short term pain with Dexon but not statistically significant and no one required stitch removal but they showed a worse long term outcome which was not reported in the previous studies and was not statistically significant but was biologically plausible. Also data from (ACOG) suggested decrease in pain which was not statistically significant with synthetic sutures and they had no wound complications, no suture residual and no wound dehiscence. Whereas not being threatening, several of such health difficulties distress large women numbers, for examples Brown and Lumley suggested that by 7 months post-partum 94% of a great populace based sample in Australia practiced one or more main health difficulties include perianal pain 21% and sexual difficulties 26%⁽²⁵⁾. Furthermore Glazener *et al* found that both technique of repair and suture constituent type utilized in perianal repairing might be dyspareunia and perianal pain determinant particularly in women with vaginal spontaneous births⁽¹⁰⁾. Regarding our study 3 significant statistical differences were there in maternal outcome have been observed between women of perianal repairing with Dexon compared with women of perianal repairing with CC; these were pain, healing and discharge.

Our study also found a significant statistical decline in pain with polyglycolic sutures in 7-10 days postpartum which was parallel to the previous studies. In our study, healing was better with polyglycolic sutures and was statistically significant but it was not mentioned in the previous studies. Beard, Livingstone, Mackrodt and Banninger in their trials reported superficial wound dehiscence up to day 10. The results from the first three trials revealed no statistically significant differences^(22,23,26) while the CC group in trial of Banninger has a statistically higher suture dehiscence rates compared to polyglycolic sutures⁽²⁷⁾. In our study, there were no cases of wound dehiscence in both groups which were similar to what was reported in the Olah trial. In general overall perianal repairing with synthetic absorbable constituents are of less wound dehiscence⁽²⁸⁾. Furthermore, vaginal discharge was less with polyglycolic suture and it was statistically significant (Table (3)) but it was also not mentioned in the other studies. This discharge needs further evaluation to know whether it is physiological or pathological. In midwives study one case in every group an infection reported at repairing site and nothing was stated in other studies about infection. In our study, infection was reported with less incidence in group A, using Dexon and was statistically not significant (Table (3)). Moreover, suture removal was not required in both groups (A, B) similar to midwives and (ACOG) studies but unlike studies obtained from Cochrane data base and Ipswich childbirth studies. Our long term follow up (6 weeks- 6 months postpartum) showed less incidence of dyspareunia with polyglycolic sutures but was statistically not significant this in agreement with ACOG

study but disagree with Cochrane and midwives studies. The suture constituent's effect on maternal morbidity beyond 3 months was observed in groups A and B, resuturing of episiotomy was not required and no any case of rectovaginal fistula was reported in either group.

Conclusions

In conclusion, perianal repair with Dexon suture seems to elicit less postpartum discomfort (pain, dyspareunia), good healing, less discharge and less infection rate when it is compared with CC. Also there is no need for the late stitch removal.

Recommendations

We recommend further studies to be done for comparing Dexon with other synthetic absorbable suture like polyglactin (Vicryl) also to compare outcome with different repair technique (e.g. interrupted versus continuous suturing).

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