

# Incisional herniae following lower segment caesarean section: A 20-year chart review

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## Abstract

**Introduction:** The rates of caesarean delivery is increasing worldwide as well as in Sri Lanka. Incisional hernia is a known complication of abdominal surgery. To our knowledge there has been no study to assess the incidence of incisional hernia following caesarean section in Sri Lanka. This study was to assess the incidence of incisional hernia requiring surgical repair after lower segment caesarean section (LSCS) in a cohort during a 20-year period.

**Methods:** This was a chart review based on tertiary care private sector hospital in Sri Lanka. Hernia repairs performed during 2002 to 2022 were identified. The data was retrieved from computer based data base and previous bed head tickets. The main inclusion criterion was a caesarean delivery from the 01<sup>st</sup> of January 2002 to 31<sup>st</sup> of December 2022 in women with no history of previous abdominal surgery. The cohort was assessed from their first caesarean delivery until 20 years in the inclusion period for an event of hernia repair. The following exclusion criteria for the hernia repairs were used: Diastasis recti-without hernia, hernia not in the caesarean incision, and no hernia. The study was approved by the Research and Ethical Committee of Nawaloka Hospital Sri Lanka. The patient records and the data-set were anonymized before analysis. No conflict of interest.

**Results:** There were 2675 records retrieved. The mean age of the patients was 28±7.5 years. There were 10/2675 (0.37%) patients were found to incisional herniae following LSCS. The majority (7/10) of patients with incisional hernia had lower midline incisions for their LSCS. The average time duration of the occurrence of incisional hernia following a single LSCS was 19.5±2.3 months and it was 14.3±1.6 and 12.3±1.5 months for following second and third LSCS respectively. Majority of the incisional herniae were done as routine cases. Following the incisional hernia repair one patient had a recurrence after year.

**Conclusion:** The overall incidence of having an incisional hernia requiring repair of a caesarean delivery was 0.37%. Most herniae appeared within the first two years and associated with the lower midline incisions.

**Key words:** incisional herniae, lower segment caesarean section, recurrent herniae, pregnancy, laparotomy

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## Introduction

The rates of caesarean delivery is increasing worldwide as well as in Sri Lanka<sup>1,2</sup>. Incisional hernia is a known complication of abdominal surgery, with a reported incidence of 3.0-20.6% in association with midline incisions and 0-2.1% with lower transverse incisions<sup>3-6</sup>. However, there is a scarcity of studies which have been focused on incisional hernia after caesarean delivery and even the available literature seems to be underreported<sup>7-12</sup>. To our knowledge there has been no study to assess the incidence of incisional hernia following caesarean section in Sri Lanka. The objective of this study was to assess the incidence of incisional hernia requiring surgical repair after caesarean delivery in a cohort during a 20-year period.

## Methods

This was a chart review based on tertiary care private sector hospital in Sri Lanka. Hernia repairs performed during 2002 to 2022 were identified. The data was retrieved from computer based data base and previous bed head tickets. These data bases contained information on age, gender, surgical procedure, diagnosis, readmission, and reoperation, but no surgical details such as surgical technique and suture material. The main inclusion criterion was a caesarean delivery between 01<sup>st</sup> of January 2002 to 31<sup>st</sup> of December 2022 in women with no history of previous abdominal surgery. The cohort was assessed from their first caesarean delivery until 20 years in the inclusion period for an event of hernia repair. The primary hernia repair, and any recurrences were also included. The records were analysed by a consultant general surgeon to validate the relationship between hernia repair and caesarean delivery. The following exclusion criteria for the hernia repairs were used: Diastasis recti without hernia, hernia not in the caesarean incision, and no hernia. The study was approved by the Research and Ethical Committee of Nawaloka Hospital Sri Lanka. The patient records and the data-set were anonymized before analysis. No conflict of interest.

## Statistics

The descriptive statistics were expressed as mean  $\pm$  standard deviation or number (percentage). Continuous data were analysed by using ANOVA test. The mean comparison was done by Post-Hoc Test. The data analysis was carried out using the Statistical Package for Social Sciences (SPSS®) software, version 20.0 (IBM® Corp., Armonk, NY, USA). A p-value of less than 0.05 was considered statistically significant.

## Results

There were 2675 records were retrieved. The mean age of the patients was  $28 \pm 7.5$  years. There were 2355 (88%), 225 (8.41%) and 95 (3.55%) had undergone once, twice and three times of LSCS respectively. There were 10/2675 (0.37%) patients were found to incisional herniae following LSCS. Seven (7/10) patients had lower midline incisions and three (3/10) had lower transverse incision for their LSCS. All of the midline LSCS were found to have the incisional herniae placed on the centre of the scar whereas 1 of the incisional herniae related to the lower transverse LSCS were found to be at the middle of the incision and the rest were found on the corners of the scars. The average time duration of the occurrence of incisional hernia following a single LSCS was  $19.5 \pm 2.3$  months and it was  $14.3 \pm 1.6$  and  $12.3 \pm 1.5$  months for following second and third LSCS respectively. Majority of the incisional herniae were done as routine cases. Following the incisional hernia repair one patient had a recurrence after year (Table 1).

## Discussion

This chart review found that 0.37% developed incisional hernia requiring surgical repair. The risk of a hernia repair was higher during the first 2 years after a caesarean delivery. Most of the hernia repairs were performed within the first two year after the caesarean delivery. Our study thereby confirms previous studies showing that most of the incisional hernias develop within the first 2 year after surgery<sup>4-6, 13-14</sup>. Our study found that the hernia repairs done were associated with the lower midline LSCS than that of lower transverse LSCS incisions. According to the literature, the lowest incidence of incisional hernia in midline incisions was 3.0% in gynaecological surgeries<sup>4</sup>. Another study found that 16% of incisional hernias occurring within 10 years of laparotomy are surgically repaired<sup>7</sup>. Previous studies have found that the risk of developing a hernia in a midline compared with a transverse incision is increased, with odds ratios of 1.68 to 3.33<sup>8-13</sup>. Therefore we believe that the risk of a hernia in a transverse incision requiring repair is therefore probably lower than the risk found to be with the lower midline incision. Factors other than the type of incision have been suggested to influence the development of incisional hernias. The suture material and suture technique used to close the fascia have been shown to affect the risk of incisional hernia in midline incisions.

**Table 1. The characteristics of the study population**

Variable	Number or Mean ( $\pm$ SD) N=2675	% or P-value
<b>Age (Years)</b>	28 $\pm$ 7.5	-
<b>Number of deliveries by LSCS<sup>1</sup></b>		
Only one LSCS	2355	88.04
Two LSCS	225	8.41
Three LSCS	95	3.55
<b>Average duration of hernia occurrence following LSCS (in months)</b>		
Only one LSCS	19.5 $\pm$ 2.3 <sup>a</sup>	P=0.022 <sup>2</sup>
Two LSCS	14.3 $\pm$ 1.6 <sup>b</sup>	
Three LSCS	12.3 $\pm$ 1.5 <sup>b</sup>	
<b>Number of incisional hernia repair following LSCS<sup>1</sup></b>	10	0.037
<b>Type of hernia based on incision (n=10)</b>		
Midline incision	7	70.0*
Transverse incision	3	30.0*
<b>Sit of hernia identified</b>		
1. Midline incision (n=7)	7	100.0**
A. Centre of the incision		
2. Transverse incision (n=3)		
A. Conner of the transvers incision	2	66.6***
B. Middle of the transvers incision	1	33.4***
<b>Complications following herniotomy (n=10)</b>		
None	8	80.0%
Seroma	1	10.0%
Recurrence after one year	1	10.0%
<b>Time of surgery (n=10)</b>		
Routine	9	90.0%
Emergency	1	10.0%

<sup>1</sup> Lower segment caesarean section<sup>2</sup> ANOVA (POSTHOC TEST)

\* Percentage was calculated as denominator: N=10

\*\* Percentage was calculated as denominator: N=7

\*\*\* Percentage was calculated as denominator: N=3

<sup>a,b</sup> Means having a superscript with the same letter are similar

The development of incisional hernias may also be influenced by factors such as BMI and post-caesarean complications including infection. Unfortunately our retrieved data base did not contained details of these factors for further analysis<sup>10-14</sup>.

## Conclusion

This study found that the overall incidence of having an incisional hernia requiring repair of a caesarean delivery was 0.37%. Most herniae appeared with in the first two years. Most hernias were associated with the lower midline incisions than that of transverse incision.

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## Authors contributions

VA, HD and LG formulated the concept and design of the study, acquisition of data and analysis, and drafted the article. All authors review the manuscript.

## Funding

None declared.

## Availability of data and materials

The datasets generated and analyzed during the current study are available from the corresponding author upon reasonable request.

## Data collection and ethical approval

Nawaloka Research and Education Foundation, Nawaloka Hospital PLC, Colombo.

## Competing interests

The authors declare that they have no competing interests.

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