

## THE INCIDENCE AND RISK FACTORS OF INCISIONAL HERNIA IN POST-CAESAREAN SECTIONS

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### ABSTRACT

**Objectives:** To assess the current incidence of incisional hernia post cesarean section amongst women attending surgical outpatient clinic, and also to evaluate the epidemiological factors in those women.

**Methods:** This is a prospective study of 94 women attending surgical outpatients' clinic during a period of two years between Jul. 2008 and Aug. 2010 at Prince Rashid Bin-Al-Hassan Military Hospital, Irbid-Jordan. The influence of demographic data, pre-, intra- and postoperative risk factors for incisional hernia development were evaluated.

**Results:** The current incidence of incisional hernia post cesarean section was 3.8%. It followed midline incision in 84% patients and pfannenstiell incision in 16%. 28.5% of all incisional hernias developed in the first 6 months after the operation and 55.8% after 1 year. 84% had midline incisions, wound infections occurred in 71.3%, previous one or more caesarean sections 85.1%, the use of wrong suture materials for fascia repair in 76.6%, while overweight in 68.1%.

**Conclusion:** The development of incisional hernia following cesarean section is uncommon but higher than previously reported. Many predisposing factors for incisional hernia may reduce the overall incidence of incisional ventral hernia when corrected.

**Key words:** incisional hernia, incidence, epidemiological factors.

### INTRODUCTION

An incisional hernia, also called a ventral hernia, is a bulge or protrusion that occurs near or directly along a prior abdominal surgical incision. It has been described as a bulge visible and palpable when the patient is standing and often requiring support and repair<sup>(1)</sup>. Incisional hernia formation is one of the most frequent complications in visceral surgery requiring reoperation. Risk factors for incisional hernia formation and preventive strategies are not clearly defined<sup>(2)</sup>.

Caesarean operations accounted for most of the postoperative incisional hernias seen in our surgical clinic. The accurate incidence of incisional hernia after cesarean section is unknown. Incidence of 3.1-5.6 % has been reported<sup>(3,4)</sup>. Over half of incisional hernias are diagnosed within the first year after surgery, and approximately 80% are diagnosed within the first 3 years<sup>(5)</sup>. Incisional hernias are more likely to occur when a patient's wound has been poorly sutured, particularly with catgut, or has become infected, or if she has a chronic cough, anemia, diabetes mellitus, jaundice, obesity or some serious systemic disease, such as advanced malignancy<sup>(6)</sup>.

Review of the literature on caesarean section in Jordan revealed inadequate recognition of this late consequence despite the increasing rate of caesarean section<sup>(7,8)</sup>. So in this study we try to assess, the current incidence of incisional hernia post cesarean section amongst women attending surgical outpatient clinic in this hospital in the north of Jordan. And also we evaluate the risk

factors associated with incisional hernia in those women.

### METHODS

This is a prospective study of 94 women attending surgical outpatients' clinic. This study was conducted between the 1<sup>st</sup> of Jul. 2008 and the end of Aug. 2010 at Prince Rashid Bin-Al-Hassan Military hospital in the north of Jordan. The inclusion criteria include women who presented with incisional hernia post caesarean section either pfannenstiell or midline incision. The study was approved by ethics committee and informed written consent from all participants was obtained. Clinical examination of the patients was performed for all women, specially looking for the presence of incisional hernia (palpable incisional fascial defect, or visible bulge in the laparotomy incision). Maternal demographics, obstetrical events, indication for caesarean section, delivery outcome, history of chronic cough, history of smoking, previous medical and surgical history were evaluated. Also perioperative data included type of anesthesia (general or spinal), operative time, blood transfusion, fever and local wound complications (cellulitis, infection, hematoma and dehiscence) were documented for each patient. All the data were compiled and continuous variables were analyzed using Student t-test.

### RESULTS

During the study period (2008-2010), 2470 patients underwent caesarean section (either pfannenstiell or midline incision), 94 (3.8%) women developed incisional hernia, and 2376 women (96.2%) did not develop incisional hernia.

It followed midline incision in 84% patients and pfannenstiell incision in 16%. So the current incidence of incisional hernia post cesarean section amongst women attending surgical outpatient clinic in our hospital was 3.8%.

In addition, the study revealed that 28.5% of all incisional hernias developed in the first 6 months after the operation, and 55.8% after 1 year. The demographic, obstetric, medical characteristics of women who developed incisional hernia together with the anesthetic data and wound complications are summarized in Table 1.

Of 94 women who developed incisional hernia post cesarean section, five major associated risk factors were found to be of significant importance within this group: 79 patients (84%) had midline incisions, wound infections occurred in 67 patients (71.3%), previous one or more caesarean sections in 80 patients (85.1%), the use of wrong suture materials for fascia repair in 72 patients (76.6%), while overweight (body mass index > 25 kg/m<sup>2</sup>) in 64 patients (68.1%). Other factors (chronic cough, gestational diabetes, cigarette smoking, and perioperative blood transfusion were not significant).

**Table I : Major risk factors associated with incisional hernia in 94 patients.**

Factors	No. of patients	Percentage
Midline incisions	79	84.0%
Wound infection	67	71.3%
Absorbable sutures	72	76.6%
Previous caesarean sections	80	85.1%
Overweight	64	68.1%
Chronic cough	10	10.6%
Gestational diabetes	5	5.3%
Perioperative blood transfusion	7	7.4%
Cigarette smoking	8	8.5%

### DISCUSSION

An incisional hernia can develop in the scar tissue around any surgery performed in the abdominal area, depending upon the location of the hernia; internal organs may press through the weakened abdominal wall. In the context of cesarean section, eventration of the wall, or incisional hernia, is one of the most prevalent complications. Despite numerous improvements over the years in suture materials and closure techniques, the incidence of incisional hernia has not diminished<sup>(9)</sup>. There is an insufficient and conflicting report on the frequency of incisional hernias post cesarean section. Our study showed the current incidence of incisional hernia post cesarean section was 3.8%, which is comparable to study of Adesunkanmi AR et al<sup>(3)</sup> which found the incidence of 3.1% of total 701 patients who had caesarean sections during the period of the study, but higher than Oscar Agüero<sup>(10)</sup> study which have incidence of 1.3%.

They may develop months after the surgery or years after, usually because of inadequate healing or excessive pressure on an abdominal wall scar. Our study revealed that 28.5% of all incisional hernias developed in the first 6 months after the operation, and 55.8% after 1 year similar to study of Höer J et al<sup>(11)</sup>.

The major possible predisposing factors identified in this study are not much different from those reported elsewhere<sup>(12,13)</sup>. Wound infection has continued to be an important risk factor. It was contributory in 71.3% of our patients; while the overall post-caesarean wound infection rate was 19% as shown by Koigi-Kamau R et al<sup>(14)</sup>.

In our study incisional hernia post cesarean section developed in 84% patients with midline incisions, this is in agreement with previous observations which showed that there is lower incidence of late incisional hernia after transverse compared with vertical incisions<sup>(15,16)</sup>.

Our data revealed that the most important constant and independent factor for incisional hernia post cesarean section is the repeated frequency of caesarean section as it occurred in 80 patients (85.1%) in our study. With the increased occurrence of this operation, it expected to increase the likelihood of hernia formation, this inconsistent with other study that showed maternal mortality and morbidity in women who have two or more previous caesarean sections did not differ from the patients with one previous caesarean section<sup>(17,18)</sup>.

Incisional hernia is expected in patients who have absorbable suture for fascia repair. It requires suture materials whose tensile strength will still

hold until the fascia heals. As noted in our series (76.6%), herniation through the scar was more frequent possibility due to use of wrong suture materials for fascia repair. A consensus of these is that a running suture of the fascia with slowly absorbable or non-absorbable sutures results in the lowest incidence of incisional hernias<sup>(19)</sup>.

The factors that increase the risk of incisional hernia are conditions that increase strain on the abdominal wall, such as obesity as overweight (body mass index > 25 kg/m<sup>2</sup>) occurred in (68.1%) in our study. Obesity clearly increases the risk of incisional hernia; therefore, we suggest that whenever possible, reduction of weight should be encouraged before laparotomies and incisional hernia repair in overweight patients<sup>(20)</sup>.

Age, parity, gestational diabetes, chronic cough, cigarette smoking, and perioperative blood transfusion were found to not be associated with increased risk for hernia formation, in agreement with other studies in this area<sup>(21,22)</sup>.

Conclusion: We can conclude from this study that the development of incisional hernia following cesarean section is uncommon but higher than previously reported. Although many predisposing factors for incisional ventral hernia are patient-related, some factors such as type of primary closure, materials used and through a combination of health education and sound surgical technique with good wound care may reduce the overall incidence of incisional ventral hernia.

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