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Concomitant Hernia Repair and Caesarean Section

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ABSTRACT

Background: Concomitant hernia repair during Cesarean section (CS) remains an uncommon practice despite the overlapping anatomical site and rising incidence of both CS and ventral hernias. Limited data exist regarding its safety and efficacy. **Aim:** This study aimed to evaluate the outcomes of combining ventral hernia repair with elective Cesarean section in comparison with Cesarean section alone.

Patients and methods: This retrospective study included 24 women (Group I) who underwent simultaneous mesh repair of ventral hernia (Umbilical, paraumbilical, or incisional) during elective CS, compared with 50 women (Group II) who underwent CS alone between 2013 and 2019. Hernias repaired had defect sizes < five centimeters. Postoperative pain, length of hospital stay, operative time, hemoglobin levels, and complication rates were evaluated.

Results: Demographic variables including age, gravidity, and parity were comparable between groups. The mean operative time was significantly longer in group I (90 ± 25 minutes) than in group II (60 ± 10 minutes) (p below 0.001). There were statistically insignificant variances in hospital stay, pre- and post-operative hemoglobin levels, or rates of posto-perative complications like wound sepsis, seroma, or wound disruption ($p > 0.05$).

Conclusion: Concomitant ventral hernia repair during Cesarean section is a safe and efficient option for selected patients. Although, associated with a longer operative time, it does not increase postoperative morbidity or hospital stay, supporting its consideration in properly selected cases.

Keywords: Cesarean section, Ventral hernia, Concomitant surgery, Mesh repair, Maternal outcomes.

INTRODUCTION

Hernia repair is among the majority frequent general surgical procedures conducted globally, representing a significant component of abdominal wall surgery. The development of hernias often results from a multifactorial interplay between increased intra-abdominal pressure, weakened musculofascial structures, previous surgical incisions, connective tissue disorders, obesity, and pregnancy [1]. These anatomical defects can lead to the protrusion of intra-abdominal contents during weakened points in the abdominal wall, necessitating surgical intervention. The World Society of Emergency Surgery (WSES) classifies abdominal wall hernias into groin hernias (Inguinal and femoral) and ventral hernias (Including umbilical, paraumbilical, epigastric, and incisional hernias) based on their anatomical location [2].

Gestation itself is a recognized risk factor for hernia formation due to the physiological changes it induces, including stretching and thinning of the abdominal wall and elevated intra-abdominal pressure. As Cesarean section (CS) rates continue to rise globally, the intersection between obstetric and general surgical concerns becomes increasingly relevant. Once considered a life-saving procedure in emergent obstetric scenarios, the CS has now become a commonly utilized method of delivery—even in the absence of strict medical indications—owing to maternal preference, fear of labor pain, medico-legal considerations, and perceived safety [3]. Despite its growing acceptance and improved surgical techniques, CS is not devoid of complications. Postoperative morbidity may include hemorrhage, infection, thromboembolism, adhesions, and notably, incisional hernias, which can significantly affect a woman's quality of life and future abdominal operations. Studies report that the incidence of incisional hernias following abdominal surgery varies depending on the type of incision, with midline vertical incisions carrying a higher risk (3.0–20.6%) compared to transverse (Pfannenstiel) incisions (0–2.1%) [4]. Risk factors such as overweightness, poor wound healing, infection, and repeated Cesarean deliveries further increase the likelihood of hernia formation [6].

Given the frequency of Cesarean deliveries and the relatively high prevalence of ventral hernias in the general woman population, it is not uncommon for obstetricians to encounter pregnant women with coexisting hernias—most frequently paraumbilical or umbilical types. However, despite the overlapping anatomical and surgical fields, the simultaneous repair of hernias during Cesarean delivery remains underutilized in clinical practice [7].

The concept of concomitant hernia repair during Cesarean section was first documented in 1987 case report, followed by a limited case series involving a small number of patients with successful outcomes [5]. Still, this combined surgical approach has not gained widespread adoption. This hesitation may stem from concerns over increased operative time, added surgical risks, potential for infection, the need for mesh implantation in a potentially contaminated field, and the traditionally conservative approach in obstetric surgeries focused on minimizing maternal morbidity [5].

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On the other hand, proponents of combined surgery argue that it offers numerous advantages: it avoids the need for a second anesthetic exposure, reduces hospital admissions and recovery time, and addresses the hernia before it potentially worsens during subsequent pregnancies or physical activity postpartum. In cases where the hernia is symptomatic or cosmetically concerning, repair at the time of CS may be a practical and patient-centered option [8].

Despite these potential benefits, data regarding safety, efficacy, recurrence rates, and optimal surgical techniques in this context remain limited and inconclusive. The lack of standardized guidelines or large-scale prospective studies has contributed to ongoing controversy and variability in clinical decision-making [9].

This research aimed to assess the result of concomitant Cesarean section and the repair of hernia, in retrospective research at a teaching hospital.

PATIENTS AND METHODS

In this retrospective research, the result of 24 pregnant females who submitted to ventral hernioplasty concomitant with Cesarean section (as an elective procedure) in seven years starting from 2013 till the end of 2019 (group I) was compared to another group of 50 pregnant females who submitted to Cesarean section only (group II) at the same time as a control group.

Inclusion criteria: Ventral hernias as umbilical, paraumbilical and incisional, size of hernial defect less than 5 cm. Data for evaluation are: Time of the procedure, length of admission as well as post-operative complications.

Exclusion criteria: Large sized hernial defect (More than 5 cm), chronic medical diseases that might put the patient at greater risk of complications, such as cardiac disease, bad chest condition, diabetes, morbid obesity or anaemia.

The patients in (group II) the control group were healthy, had no chronic medical diseases, such as cardiac disease, anemia, diabetes and morbid obesity.

Surgical technique: All patients in both groups underwent a standard lower transverse Cesarean section under either spinal or general anesthesia, based on anesthesiologist assessment and patient condition. In group I (concomitant hernia repair), following the fetus delivery and the cutting and clamping of the umbilical cord, the hysterotomy was closed securely to ensure a dry surgical field. The abdominal area was then re-prepared and draped for the subsequent hernia repair. The hernia was repaired using a Prolene® (polypropylene) mesh hernioplasty technique. The mesh was placed in the onlay position and fixed using non-absorbable sutures to ensure long-term structural integrity. All patients received prophylactic intravenous third-generation cephalosporins immediately after placental delivery to decrease the possibility of postoperative infection. No drains were routinely placed unless deemed necessary based on intraoperative findings.

Postoperative analgesia and care: Postoperative pain management was standardized across both groups. All patients received intravenous non-steroidal anti-inflammatory drugs (NSAIDs) every twelve hours and intravenous paracetamol (Perfalgan® 1 gram) every 8 hours on the day of surgery. Analgesic requirements beyond this protocol were administered on an as-needed basis and recorded for each patient, serving as an indirect measure of postoperative pain levels. Wound-related complications such as hematomas, seromas, and infections were managed conservatively, with treatment tailored to the severity of the condition. This included wound care and antibiotic therapy when indicated. All patients were jointly followed postoperatively by the obstetric and surgical teams to monitor for any complications and ensure coordinated recovery.

Follow-up was planned for the patients after discharge from the hospital every week for fourteen days, then after one month, then after six months.

Ethical consideration: The drug used in the study is confirmed by the Alsahel Teaching Hospital. The Ethics Committee of the Alsahel Teaching Hospital, General Surgery Department, approved the study protocol. Before enrollment, written informed permissions were obtained from individuals or their legal representatives in accordance with the individual's conditions. This research aimed to conduct research on humans in compliance with the Declaration of Helsinki, the ethical norm established by the World Medical Association.

Statistical Analysis

Data were analyzed utilizing standard statistical methods: Continuous variables were represented as mean ± SD and compared utilizing student's t-test. Categorical parameters have been analyzed utilizing Fisher's exact or Chi-square test, where appropriate. A p-value ≤ 0.05 has been regarded as statistically significant.

RESULTS

Age of the patient, gravidity and parity are more or less equal in both groups (group I) Caesarean delivery concomitant with hernia repair, and (group II) section only (Table 1).

Table (1): Age, gravidity and parity in both groups (group I: caesarean delivery and concomitant hernia; group II: caesarean delivery alone)

	Group I	Group II	F ratio	P value
Age (years)	30.6 +/- 2.6	28.6 +/-	1.05	0.8
Parity	2.1+/- 1.1	1.5 +/- 1.0	1.125	0.61
Gravidity	3.4 +/- 1.1	2.7 +/- 1.1	1.159	0.53

There was statistically insignificance variance among 2 groups according to the indications for Caesarean section, (1ry caesarean failure in progress, 1ry Caesarean Mal-presentation, 1ry Caesarean PROM, and 1ry Caesarean others). The procedure took significant longer time in group I in comparison with the other group, (P<.001). Time of admission was comparable in both groups (*P*=0.21). Mean haemoglobin levels preoperative and post-operative showed no significant difference in both groups.

Table (2): Indications for Caesarean section, operative time, time of hospitalization, haemoglobin level in pre- and post-operative, concomitant hernia and Caesarean section (group I), Caesarean section only (group II)

	Group I	Group II	P value
1ry CS, Failure in progress	4	9	0.9
1ry CS, Malpresentation	2	4	0.8
1ry CS PROM	1	3	0.8
1ry CS Others	1	2	0.7
PREVIOUS CS	16	32	0.9
Operative time (minutes**)**	90 +/- 25 (70- 180)	60 +/- 10 (45-90)	<0 .001
Hospital stay (days)	1.6 +/- 1.5	1.4 +/- 1.2	0.21
Preoperative hemoglobin (gm/dl)	12.5 +/- 5.7	13.4 +/- 5.2	0.35
Postoperative hemoglobin	11.4 +/- 4.5	12.2 +/- 5.3	0.38

There was statistically insignificance variance among two groups according to post-operative complications, (P above 0.05).

Table (3): Post-operative complications

	Group l	Group ll	P value
Wound sepsis	1	2	.26
Seroma	0	1	.31
Wound disruption	0	0	

DISCUSSION

Our results showed that age of the patient, gravidity and parity were more or less equal in both groups (group I) Caesarean delivery concomitant with hernia repair, and (group II) section only with p-value 0.8, 0.61, and 0.53, respectively. As well in agreement with our results, **Carilli, [10]** performed a research for simultaneous tissue repairs of umbilical hernias through Cesarean section. They found that there was statistically insignificant variance between two groups (Umbilical hernia plus CS and Caesarean section only) regarding age of the cases, gravidity, and parity (P above 0.05). In addition, **Steinemann *et al*.** [11] who investigated the additional burdens in terms of pain, morbidity and prolongation of surgery, which is added to elective Caesarean section if umbilical hernia suture repair is carried out simultaneously. They found that there was statistically insignificant variance among the two groups regarding age, gravidity, and parity, (P>0.05). Also, in accordance with our results **Ghnnam *et al*.** [12] who assessed the results of concurrent Cesarean section and para-umbilical hernia repair in a prospective research at a tertiary referral University Hospital. Insignificant variations in age, parity, or gravidity were identified among cases undergoing Cesarean delivery with hernia repair (group I) and those receiving Cesarean delivery alone (group II).

Our results illustrated that there was statistically insignificance variance among two groups regarding the indications for Caesarean section, (1ry Caesarean Failure in progress, 1ry Caesarean Mal-presentation, 1ry Caesarean PROM, and 1ry Caesarean others). In agreement with our results, **Ghnnam *et al*.** [12] found that there was statistically insignificant variance between the two groups regarding indications for Caesarean section, (CPD, failure to progress, mal-presentation, PROM and repeated caesarean delivery).

Our results showed that the procedure took significant longer time in group I in comparison with the other group, (P<.001). Time of admission was comparable in both groups (*P*=0.21). Mean haemoglobin levels preoperative and post-operative showed no significant difference in both groups. In alignment with our results, **Carilli,** [10] found that the mean duration of surgery for the umbilical hernia groups (54.1±12.73 min) were significantly longer than the corresponding mean for the control group (44.8 ± 12.6 min). There was statistically insignificant variance between the two groups according to hospital stay. In addition, **Steinemann *et al*.** [11] reported that there was statistically significant variance between two groups according to duration of operation, (P<0.001). Also. In agreement with our results **Ghnnam *et al*.** [12] reported that the mean duration of operative time was significantly longer (P < 0.001) in group I compared to group II, but the mean length of hospital stay was similar in the two groups. Insignificant variance was found among post- and pre-operative means of hemoglobin concentrations. In the study performed by **Bianchi *et al*.** [13] who compared the results of cases who had combined gynecologic procedures with ventral hernia repair (VHR) with cases that had only VHR. They found that the duration of operative time was significantly greater in the studied group than in the control group (p below 0.001). A longer length of hospital stay (LOS) has been observed in group II but not in group I. Unlike our results, **Steinemann *et al*.** [11] found that there was statistically significant variance among the two groups regarding length of stay, (P= 0.012).

Our results showed that there was statistically insignificant variance between the two groups according to post-operative complications, (P>0.05). In accordance with our results, **Ghnnam *et al*.** [12] found that there was statistically significant variance among the two groups regarding post-operative complications, (Wound sepsis, seroma, and wound disruption). In the study conducted by, **Carilli** [10] he reported that there were no perioperative or postoperative complications.

CONCLUSION

In conclusion, concomitant hernia repair during Caesarean section was a safe and effective option for selected patients. Although operative time was significantly longer in the concomitant group (Caesarean section with hernia repair) than the Caesarean-only group. However, there was insignificant variance in hospital stay duration or pre/postoperative haemoglobin levels between the two groups. Postoperative complications like wound infection, seroma, or wound disruption were comparable and not statistically significant, indicating that combining hernia repair with Caesarean section did not increase surgical risk. Further studies are encouraged to validate these findings across diverse populations and clinical settings.

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