Singapore Med J 1998; Vol 39(1):9-13

Caesarean and Postpartum Hysterectomy

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ABSTRACT

Aim of Study: To review the cases of caesarean and post-partum hysterectomy performed over a 10-year period (1986-1996) in a teaching hospital, looking specifically at the associated morbidity.

Method: Retrospective review of case files.

Results: During the study period, there were 14 cases of caesarean and post-partum hysterectomy. Caesarean hysterectomy was performed in 0.17% of caesarean sections and a hysterectomy was done in 0.02% of cases following a vaginal delivery. Uterine atony was associated with 43% of cases. Histological evidence of placenta accreta or increta was noted in 7 (50%) cases, while 8 (57%) cases had placenta praevia. A subtotal hysterectomy was performed in 7 cases, where the mean operating time was significantly shorter than that in cases of total hysterectomy. There were no maternal deaths. Fever (28%), urinary tract infection (21%) and chest infection/atelectasis (21%) were the common post-operative morbidity. Re-laparotomy for continuing vaginal bleeding was required in 2 cases.

Conclusions: Emergency peri-partum hysterectomy for obstetric haemorrhage is a rare operation (1 in 2,550 deliveries). In spite of the intra-operative risks and post-operative morbidity, it remains a potentially life-saving procedure.

Keywords: caesarean hysterectomy, post-partum haemorrhage (PPH), obstetric haemorrhage, placenta accreta

INTRODUCTION

The first caesarean hysterectomy was performed in 1869 by Horatio Storer. The procedure was originally developed in an attempt to reduce the then appalling mortality from haemorrhage and sepsis that accompanied abdominal delivery[1]. In modern obstetric practice, emergency caesarean and post-partum hysterectomy are still critical life-saving procedures in cases of intractable obstetric haemorrhage. The purpose of this present report was to review all the caesarean and post-partum hysterectomies performed in the National University Hospital (NUH) between August 1986 and January 1996, looking specifically at the morbidity associated with these procedures.

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MATERIALS AND METHOD

A retrospective review was conducted on all cases of caesarean hysterectomy and post-partum hysterectomy done within the first 24 post-partum hours, performed between August 1986 and January 1996. The number of vaginal deliveries and caesarean sections carried out during the same study period were also obtained.

Patient case files were carefully reviewed for collection of data which included maternal age, parity, weeks of gestation, indications for hysterectomy and the time interval between delivery and hysterectomy. Intra-operative blood loss estimates made by the anaesthetic team were also noted. Ancillary procedures (eg. ligation of internal iliac vessels and administration of intramyometrial prostaglandins) performed in an attempt to control haemorrhage were also recorded. Total blood replacement (ie. all blood transfused during the pre-operative, intra-operative and post-operative period) was also noted for all patients. The operating time was obtained from the anaesthetic records. The principal surgeons performing the procedure were categorised into: a) professor or senior consultant level; b) consultant, and c) registrar level (under supervision). The presence of disseminated intravascular coagulopathy (DIVC) was noted and sub-divided into: a) mild DIVC marked only by the presence of soluble fibrin monomers or D-dimers (>0.5 mg/mL) and b) severe DIVC with thrombocytopenia (platelet count less than 100 x 10^9/L) with or without prolongation of prothrombin time (> 13.8 sec) or activated partial thromboplastin time (> 36 sec). The period of stay in the intensive care unit as well as the total hospitalisation period were noted. Prophylactic antibiotics were used in all patients. Intra-operative injuries as well as the occurence of any post-operative morbidity were recorded. Febrile morbidity was defined as two recorded temperatures >38°C, taken four or more hours apart, (excluding the first 24 hour post-operative period). The histopathological analyses of the removed specimens were also recorded.

Fetal outcome in terms of birth weight, Apgar score, admission to the neonatal intensive care unit (NICU) and the need for assisted ventilation were also noted. Statistical analysis of data was done by the Student's t-test with $p<0.05$ taken as being statistically significant.

Table I - Indications for caesarean section in 8 patients who had caesarean hysterectomies

Indications	No.
Elective Sections	
1) 2 previous caesarean sections	2
2) 3 previous caesarean sections and placenta praevia major	1
3) Placenta praevia major	1
Emergency Sections	
1) Placenta praevia with bleeding	2
2) Severe pre-eclampsia	1
3) Failure to progress	1

Table II - Indications for caesarean hysterectomy

Indications	No.
1) Bleeding from lower segment	1
2) Bleeding from placental bed (placenta praevia)	2
3) Placenta adherent to lower segment	1
4) Placenta adherent to lower segment and involving bladder	1
5) Uterine atony	2
6) Bleeding from uterine incision	1

Table III - Intra-operative and post-operative morbidity

	No	(%)
Intra-operative bladder injury	1	(7)
Urinary tract infection	3	(21)
Febrile morbidity	4	(28)
Chest infection/atelectasis	3	(21)
Jaundice	1	(7)
Re-exploration	2	(14)

RESULTS

During the period between August 1986 and January 1996, there were 35,696 deliveries, 4,751 of which were caesarean sections (13.3%). There were 8 patients (0.17%) who had a caesarean hysterectomy and 6 patients (0.02%) in whom a post-partum hysterectomy was performed within 24 hours of delivery.

The mean maternal age of these 14 cases of caesarean and post-partum hysterectomy was 34.1 ± 6.8 years (range 17-42 years). There were three (21%) primigravidas. The remaining 11 patients were parous; with a mean parity of 1.9 ± 0.7 (range 1-3). The mean gestational age at delivery was 251 ± 30 days (range 184 to 282 days).

There were 8 patients who had caesarean hysterectomies in our series. The indications for the caesarean sections are shown in Table I. Although half of the caesarean hysterectomies were after caesarean sections, none of the hysterectomies was performed as an elective procedure. The indications for the subsequent caesarean hysterectomies are shown in Table II. Amongst these, 4 cases (50%) were associated with placenta praevia and 3 cases (37.5%) had at least 2 previous caesarean sections. The placenta was morbidly adherent in 2 cases. The mean time interval between delivery of the baby by caesarean section and the completion of the caesarean hysterectomy was 117 ± 41 mins (range 70-205 mins). The estimated intra-operative blood loss ranged from 1,500 - 8,000 mLs (mean 4,187 ± 2,187 mLs).

There were six patients who had post-partum hysterectomy performed within 24 hours of a vaginal delivery. Four (66%) patients had uterine atony and two (33%) cases had morbidly adherent placentas. The median time interval between delivery of the baby to the start of the hysterectomy was 180 mins (range 60-1,320 mins). The mean intra-operative blood loss in patients with post-partum hysterectomies was 2,075 ± 1,688 mLs (range 600-5,000 mLs). When intra-operative blood loss of all 14 patients were analysed, the overall mean blood loss was 3,282 ± 2,201 mLs (range 600-8,000 mLs).

Ancillary procedures to control haemorrhage were attempted in 6 patients (43%). Only one patient after a caesarean section had intra-myometrial prostaglandin (for uterine atony) which failed to control the bleedng and she subsequently required a hysterectomy. The remaining 5 patients in whom ancillary procedures were carried out eventually required post-partum hysterectomies. Procedures used in these 5 patients included: a) uterine packing (1 case); b) Intra-myometrial prostaglandin (1 case); c) ligation of vessels (ie. internal iliacs, infundibulopelvic, uterine or ovarian vessels) (2 cases); d) ligation of vessels and intramyometrial prostaglandin (1 case).

For the 8 patients who had emergency caesarean hysterectomies, five (63%) had severe DIVC, one patient (12%) had mild DIVC and 2 cases (25%) had no evidence of DIVC. For patients requiring post-partum hysterectomies, 2 patients (33%) had evidence of mild DIVC and 3 patients (50%) had severe DIVC. In the last 3 patients with evidence of severe DIVC, the time intervals between vaginal delivery and post-partum hysterectomy was 60 mins, 240 mins and 1,320 mins respectively.

All the patients required blood transfusion. For patients with caesarean hysterectomies, the mean volume of blood transfused was 3,092 ± 2,202 mLs (median 2,665 mLs, range 680-7,820 mLs). One patient required a re-laparotomy because of persistent bleeding and she was transfused 7,820 mLs of blood. If that patient was omitted, then the mean volume of blood transfused for the remaining cases would be 2,417 ± 1,182 mLs (range 680-4,420 mLs). For patients who had post-partum hysterectomy after a vaginal delivery, the mean volume of blood transfusion given was 4,425 ± 2,661 mLs (range 1,020-8,740 mLs). Again, one patient in this group required a re-laparotomy and she received a total of 8,740 mLs of blood. If that case was omitted, then the mean volume of blood transfused for the remaining patients with post-partum hysterectomy would be 3,562 ± 1,807 mLs (range 1,020-6,120 mLs).

Seven patients had a subtotal hysterectomy done. Five were performed after caesarean section and two were post-partum hysterectomies. The mean operative time recorded was 101.4 ± 40 mins (range 60-180 mins). In one patient, intra-myometrial prostaglandin was given intra-operatively. The mean operative blood loss was 3,000 ± 1,554 mLs (range 1,000-5,000 mLs). The mean volume of blood transfused was 3,882 ± 3,147 mLs (range 680-8,740 mLs). There were 2 patients with re-laparotomies who were given

7,820 and 8,740 mLs of blood. If these 2 cases were omitted, the mean volume of blood transfused would be 2,124 ± 1,105 mLs (range 680-3,450 mLs).

Seven patients had a total hysterectomy performed (3 at caesarean hysterectomy and 4 at post-partum hysterectomy). The mean operative time was 152 ± 35 min (range 120-205 mins). However, five patients had ancillary procedures performed including 3 cases with ligation of vessels. The mean operative blood loss was 3,564 ± 2,810 mLs (range 600-8,000 mLs). The mean volume of blood transfused in these patients was 3,444 ± 1,597 mLs (range 1,020-6,120 mLs). When patients with subtotal hysterectomies were compared with those with total hysterectomies in terms of operating time, intra-operative blood loss, total blood transfused and total hospital stay; there were no statistically significant differences except that the operating time for the subtotal hysterectomy group was significantly shorter than the total hysterectomy group.

The operative procedures were mainly carried out by staff at the senior consultant (11 cases) and consultant (1 case) levels. Only in 2 cases (14%) was a surgeon at the registrar level recorded as the main surgeon.

Post-operatively, the median duration of stay in the intensive care ward was 1 day (range 0-6 days). No maternal deaths were recorded in our series. Intra-operative and post-operative morbidity is summarised in Table III. As mentioned earlier, re-exploration was required in 2 patients. The first was a 38-year-old primigravida who had an emergency caesarean section for severe pre-eclampsia at 30 weeks of amenorrhoea. The uterus was noticed to be lax after the baby was delivered but the uterine atony failed to respond to conservative measures including intramyometrial prostaglandin. Intra-operative blood loss was 3 litres and an emergency caesarean subtotal hysterectomy was performed. Post-operatively, the abdomen was found to be distended with persistent bleeding coming from an abdominal drain. She was re-explored 21 hours after her hysterectomy and bleeding areas over the uterine stump and right infundibulopelvic ligament were seen. Haemostasis was secured. She had prolonged clotting times as well as thrombocytopenia and had 7,820 mLs of blood, 450 mLs of platelets and 2,970 mLs of fresh frozen plasma transfused. She was hospitalised for a total of 19 days. The other patient was a 41-year-old gravida 4 para 2 who delivered at 39 weeks 5 days, but had postpartum haemorrhage secondary to uterine atony. She continued to bleed and had a subtotal hysterectomy one hour after delivery. Intra-operative blood loss was estimated at 1 litre. She had evidence of prolonged clotting times and was tranfused with two units of blood and one litre of fresh frozen plasma. Post-operatively, she continued to have significant vaginal bleeding and a distended abdomen. A decision was made for a re-laparotomy one hour after her hysterectomy. At re-laparotomy, some small bleeders were seen over the cervical stump and bladder bed. Haemostasis was secured and a large drain left in the abdominal cavity. Post-operatively, she continued to have significant (1,600-8,800 mLs/day) abdominal drainage. The patient was transfused aggressively and had an arteriogram done, which identified a bleeding left ovarian atery. This was embolised by a consultant radiologist using gel foam and the abdominal drainage was markedly reduced. In all, the patient received 8,740 mLs of blood, 1,200 mLs of platelet concentrate and 4,710 mLs of fresh frozen plasma. She was hospitalised for 15 days but was discharged from hospital alive and well.

The mean total hospitalisation period was 9.6 ± 4 days (range 6-19 days). Two patients who required re-exploration stayed a total of 15 to 19 days. If both these cases were omitted, then the mean period of hospitalisation was 8.3 ± 2.5 days (range 6-13 days).

When the removed specimens were examined by histopathologists, 7(50%) were found to have histological evidence of placenta accreta (4 cases) or placenta increta (3 cases). Among them, 2 cases (28%) had associated placenta praevia. Two patients (28%) also had a past history of at least one previous caesarean section. One patient (14%) with placenta accreta had both placenta praevia major as well as a past history of 3 previous caesarean sections. Therefore, 5 cases (71%) with morbidly adherent placentaes had either an associated placenta praevia or a past history of previous caesarean section.

The mean birth weight of babies in our series was 2,630 ± 864 gm (range 1,276-3,825 gms). All had 5 minutes Apgar scores ⩾ 7. Five neonates were admitted to the neonatal unit but only 2 required assisted ventilation. All babies were well at the time of discharge.

DISCUSSION

The incidence of emergency hysterectomy after caesarean section (0.2%) and vaginal delivery (0.02%) in our series is similar to reports by other authors[2,3]. Clark et al[2] reported on 70 patients seen between 1978 and 1982, who had an emergency hysterectomy for control of obstetric haemorrhage unresponsive to conservative measures. Their reported incidence of emergency hysterectomy after caesarean section and vaginal delivery was 0.7% and 0.02% respectively. Haynes and Martin[3], in a 25-year review of all caesarean hysterectomies performed in their unit, reported that 1% of their caesarean sections required emergency hysterectomies for urgent medical indications.

The age of women requiring emergency hysterectomy varies according to different reports. Gupta and Ganesh[4], in a 15-year review involving 140 women who had an emergency obstetric hysterectomy in a New Delhi hospital, reported that 52.8% of them were below 30 years of age. Clark et al[2], in a report on emergency hysterectomy for obstetric haemorrhage, found that the average age of patients undergoing hysterectomy in a Los Angeles county hospital was 30 years. In our series, the majority (79%) of our patients were above the age of 30, with a mean age of 34 years. This probably reflects the differences in the mean age of the obstetric population in these countries.

In our series, although the majority of women (79%) were parous, 21% of our patients who had either a caesarean or post-partum hysterectomy were primigravidas. There were no grandmultiparas in our series. This is similar to the report by Clark et al[2] who found that 19% of women requiring an emergency hysterectomy for obstetric haemorrhage were primigravidas. This is in contrast to the series by Gupta and Ganesh[4] who reported that nearly a third of their patients were grandmultiparas. Again, this is probably due to the different mean parity of the obstetric population studied.

When Barclay[5] published his series of 866 caesarean hysterectomies in 1970, he reported the most common indication for emergency caesarean hysterectomy as uterine atony (33%) followed by couvelaire uterus (32%) and ruptured uterus (19%). Only 2.3% of cases of emergency caesarean hysterectomy were performed for placenta accreta. Gonsoulin and colleagues[6] also reported that uterine rupture and scar dehiscence accounted for 41% of cases of emergency caesarean hysterectomy. Placenta accreta accounted for only 9% of the cases in that series. Gupta and Ganesh[4] reported that uterine rupture requiring hysterectomy made up 42% of cases in their series. There were 61 cases of obstetric haemorrhage requiring hysterectomy. The most important causes of obstetric haemorrhage in their series were uterine atony (34%), placenta accreta (23%) and placenta praevia (18%).

In our series, uterine atony was associated with 43% of our cases. Twenty-eight percent (4/14) of our patients who required hysterectomy had placenta praevia. Furthermore, all these cases with placenta praevia requiring hysterectomy, had histological evidence of either placenta accreta, or increta. Of the 14 patients in our series, 7 (50%) had histological evidence of either placenta accreta or increta. These required hysterectomy either because of uncontrollable bleeding from the placental bed (4 cases) or because of a morbidly adherent placenta that had infiltrated the myometrium (3 cases).

Clark and associates[2] have reported that the most common indication for hysterectomy for obstetric haemorrhage was uterine atony (43%) followed closely by placenta accreta (30%). Sturdee and Rushton[7] have also reported that the commonest cause of uncontrollable bleeding in their series, was a morbidly adherent placenta that occurred in 1 per 4,348 pregnancies. The problem of an increased overall incidence of placenta accreta has also been reported by Read and colleagues[8] and may be related to the association of placenta accreta with a uterine scar. Clark et al[2] found that 57% of hysterectomies performed for placenta accreta were associated with a previous caesarean section. In our series, 43% (3/7) of our patients with placenta accreta also had a previous caesarean section. Clark et al[2] also reported that in the group of patients with placenta accreta, increta or percreta, the most common indication for ceasarean section was placenta praevia (67%). In our series, 43% (3/7) of our patients with placenta accreta also had an associated placenta praevia. There was one patient with placenta accreta in our series who had both placenta praevia and a history of 3 previous caesarean sections. This ominous combination of placenta praevia, previous caesarean section and a morbidly adherent placenta has already been highlighted by other authors[7,9]. We had one patient in our series who required a caesarean hysterectomy for uncontrollable bleeding from a lateral extension of a low transverse uterine incision. This patient also had the longest operating time (205 mins) and delivered the largest baby (3,555g) born by caesarean section. Clark et al[2] also reported that the largest mean fetal weight (3,935g) and the longest operating time (3.8 hours) occurred in the group of patients for which hysterectomy was performed for extension of a low transverse uterine incision. The authors also highlighted the risk of extension of the low transverse uterine incision into the broad ligament during delivery of a large baby as well as the extra time needed to repair the extension without damage to the ureter.

The operative blood loss associated with emergency hysterectomy varies according to different reports. Gousoulin and colleagues[6] estimated that mean blood loss associated with emergency caesarean hysterectomy was 1,495 mLs. Strickland et al[10] reported that the blood loss associated with emergency caesarean hysterectomy was in excess of 2,000 mLs in 35% of their cases. Clark and associates[2] found that the mean blood loss for their patients undergoing emergency hysterectomy for obstetric haemorrhage was 3,575 mLs. In our series, the mean intra-operative blood loss was 3,282 mLs.

Clark et al[2] in their series, reported that 46% and 54% of their cases had total abdominal hysterectomies and subtotal (supracervical) hysterectomies respectively. In our study, half of our cases had subtotal hysterectomies performed as an emergency procedure. When Clark et al[2] compared the mean blood loss, operative time and hospital stay of patients who had either total or subtotal hysterectomies, they found that there were no significant differences in the above clinical data that correlates between the two procedures. In our series, there were no statistically significant differences in the operative blood loss, amount of blood transfused and hospital stay between the patients with total and subtotal hysterectomies. However, the patients with subtotal hysterectomies had significantly shorter operating times compared to the patients with total hysterectomies.

Although emergency caesarean and post-partum hysterectomy are critical life-saving surgeries, the complications associated with these procedures should not be underestimated. Although our series did not report any maternal death, maternal mortality in a cumulative literature review has been estimated at 0.71%[12]. Stickland et al[10] reported 4 deaths (1.8%) in their series but all were more related to an obstetric catastrophe, rather than due to the hysterectomy itself. In general, caesarean and post-partum hysterectomy are also associated with an increased risk of haemorrhage and urologic injury.

The incidence of urologic injuries after caesarean hysterectomy has been reported to range between 0.3% to 0.9%[13]. However, these have included elective caesarean hysterectomies where the risk of urologic injury is somewhat less than that during an emergency procedure. Other authors have also reported the incidence of urologic injuries in emergency hysterectomies to range from 3.6% to 6.7%[3,4,14]. Haynes and Martin[3] found that iatrogenic bladder injury was the most common operative complication in their 25-year review of caesarean hysterectomy performed at the Louisville General Hospital, Kentucky. We had 1 bladder injury (7%) in our small series and it occurred in a 35-year-old patient who had a caesarean hysterectomy for placenta percreta. A total hysterectomy was performed and the bladder was accidentally entered during dissection of the bladder which was infiltrated by the placenta. Patterson[11] in a review of 327 caesarean hysterectomies, also reported that all the urinary tract injuries occurred with total hysterectomy and suggested that a subtotal hysterectomy may be preferable. Gupta and Ganesh[4] reported a 3.6% incidence of urinary tract injuries in their report on emergency obstetric hysterectomy. A significant proportion (60%) of these injuries occurred while attempting haemostasis for haemorrhage during repeat caesarean section. They have suggested in such patients with previous caesarean sections, that the bladder be sharply dissected away from the uterine incision site so that the bladder will not be accidentally injured during haemostasis for unexpected heavy bleeding. The dreaded complication of an unrecognised intra-operative bladder injury is a vesico-vaginal fistula. To avoid this, some authors[14] have even proposed that bladder integrity be routinely evaluated in all patients after a caesarean hysterectomy.

Urinary tract infection has been reported as the most common post-operative complication by several authors[5,10], with incidences that range from 7% to 23.4%. In our series, post-operative urinary tract infections complicated 21% of our cases.

The incidence of febrile morbidity associated with peri-partum hysterectomy has been reported to be between 31% and 61%[4,5,14]. In our series, 28.5% of our cases were documented to have had post-operative febrile morbidity.

Yancey and colleagues[15] have also highlighted the increased incidence of blood transfusion associated with emergency hysterectomy. The incidence of blood transfusion in patients with emergency peri-partum hysterectomy has been reported to range from 68% to 100%[2,6,14]. In our series, all our patients required blood transfusion with a mean value of 3,282 mLs being transfused. One of our patients subsequently developed mild jaundice on the twelfth post-operative day with a raised serum unconjugated bilirubin of 35 mmol/L.The jaundice was attributed, not to a blood transfusion related infection, but rather, to the breakdown of haemoglobin from the extensive bruising present over the anterior abdominal wall.

The incidence of re-laparotomy after emergency hysterectomy because of continued post-operative bleeding has been reported by some authors to be 2%[4,5]. In our report, 2 patients (14%) required re-exploration after emergency hysterectomy to secure haemostasis. This underlies the need for meticulous haemostasis after emergency hysterectomy if re-laparotomies are to be avoided.

CONCLUSION

The need for an emergency peri-partum hysterectomy for obstetric haemorrhage was rare and occurred once in every 2,550 deliveries in our series. Although the procedure is associated with intra-operative risk and post-operative morbidity, it still remains a potentially life-saving procedure that every practicing obstetrician must be familiar with.

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