

Placenta praevia and accreta after previous caesarean section

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Abstract

A prospective study was undertaken to determine the relationship between previous caesarean section (CS), placenta praevia and placenta praevia accreta. Of 41 206 consecutive deliveries 1851 had had previous caesarean section and 222 had placenta praevia. Of the cases of placenta praevia, 175 occurred in the uterus and 47 occurred after previous CS. Placenta praevia complicated 2.54% of cases with a previous caesarean section compared with 0.44% of cases with no scar — a 5-fold increase. In patients with placenta praevia occurring with a previous scar, 18 were complicated by placenta accreta (38.2%) compared with only 8 (4.5%) in unscarred uteri. After one caesarean section, placenta praevia was complicated by accreta in 10% of cases and after two or more this was 59.2%. The risk of hysterectomy with placenta praevia and uterine scar was 10% but with placenta praevia accreta it was 66%. There was one maternal death in the placenta praevia accreta group.

Key words: Caesarean section; Placenta praevia; Placenta accreta

1. Introduction

The rate of caesarean section (CS) is increasing in most countries. However, the long-term maternal morbidity and the obstetric future of women who have had previous caesarean birth needs further evaluation.

Bender [1] first suggested that a uterine scar could predispose the mother to the development of placenta praevia in subsequent pregnancies. Recent studies by Clark et al. [2] and Rose and Chapman [3] have confirmed the significant relation-

ship between placenta praevia and previous CS. Placenta praevia is strongly associated with placenta accreta [4]. The incidence of placenta accreta is as high as 67% in patients with placenta praevia and multiple previous CS [2]. This association of previous CS, placenta praevia and placenta accreta is becoming increasingly acknowledged and is causing concern since it carries a significant risk of caesarean hysterectomy with its incumbent morbidity and mortality.

The sequence of previous CS, placenta praevia accreta, and possible hysterectomy is of greater concern in Saudi Arabia, where the social preference is for a large family. The phenomenon is fur-

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ther compounded by the progressive increase in CS rate from 3.9% in 1979 to 9.9% in 1985 [5]; however, the CS rate stabilized at 9–10% from 1986 to 1991.

2. Patients and methods

Between July 1988 and June 1992, 41 206 women delivered in the Maternity and Children's Hospital, Riyadh, (MCH). There were 39 355 women presenting with an unscarred uterus, while 1851 (4.5%) had had one or more caesarean sections (CS). Of these 1851 women with previous CS, 1002 (54%) delivered vaginally and 849 (46%) had repeat CS.

Patients who fulfilled the following criteria were included in the study:

- (i) Previous CS and current delivery by CS during the study period.
- (ii) Placenta praevia diagnosed by ultrasound scanning and confirmed at CS.

Exclusion criteria were:

- (i) Cases of previous CS with suspected placenta praevia diagnosed by ultrasound but where, at operation, the placental site was in the upper uterine segment.
- (ii) Cases of previous CS with partial, marginal, or low lying placenta diagnosed by ultrasound but delivered vaginally.

Ultrasound scanning was used routinely for all patients between 16 and 20 weeks of gestation; however, earlier scans would have been performed on patients with a history of vaginal bleeding. Cases with low lying placentae were followed-up with repeat abdominal ultrasound scans.

The ultrasound scanners were Aloka SSD 280 LS 3.5 MHZ linear probe and Toshiba Sonolayer SAL 38B with electronic convex 3.5 MHZ probe.

The patients with placenta praevia were admitted to hospital at 24 weeks of gestation or later, as and when diagnosed. In the hospital blood was cross-matched for transfusion and the maternal and fetal condition were assessed regularly.

The main events recorded at operation were the

volume of blood loss and amount of blood transfused, incidence of disseminated intravascular coagulation (DIC) and intraoperative hypotension (systolic, < 70 mmHg). Major artery ligation or hysterectomy during CS or during reexploration were also documented. Major complications such as oliguria, injury to the urinary tract, and maternal deaths were analysed.

Placenta accreta is a general term for all cases of morbidly adherent placenta. The diagnosis of placenta accreta was made on the basis of difficulty in separation of the placenta from the uterine wall, making it necessary to remove it piecemeal or preventing complete removal by an experienced obstetrician. The diagnosis, therefore, was a clinical one except where hysterectomy was necessary, when histologic examination confirmed the diagnosis of morbid adhesion to the uterine connective tissue or myometrium with the absence of intervening decidua.

Three groups of patients with placenta praevia were compared: placenta praevia with no prior CS, with prior CS but no accreta, and with prior CS and placenta accreta. Significance testing was done with χ^2 analysis or Fisher's exact probability test using Epinfo software.

3. Results

During the 4-year study period 41 206 women delivered at MCH; 39 355 presented with an unscarred uterus while 1851 had had previous CS. In the series of 41 206 patients, 222 (0.54%) underwent CS because of placenta praevia; with no previous CS the incidence of placenta praevia was 0.44% (175/39355) and with previous CS it was 2.54% (47/1851), a 5-fold higher incidence of placenta praevia with previous CS compared with those with an unscarred uterus (Table 1).

The more caesarean sections a patient had, the higher was the placenta praevia rate, ranging from 1.89% with 1 previous CS to 3.38% with 2 or more CS (Table 1). The number of patients with placenta praevia and 2 or more previous CS was not large enough to be subdivided.

The risk of placenta accreta ranged from 4.5% in patients with placenta praevia and an unscarred uterus to 38.2% in patients with previous CS and

Table 1
Incidence of placenta praevia and placenta accreta

Deliveries	<i>n</i>	Placenta praevia including accreta	% of total deliveries	Placenta accreta with praevia	% of all placenta praevia	<i>P</i> -value
Total	41 206	222	0.54	26	11.7	—
Unscarred uterus	39 355	175	0.44	8	4.5	—
Previous CS	1 851	47	2.54	18	38.2	<0.001
One previous CS	1 054	20	1.89	2	10.0	<0.001
Two or more previous CS	797	27	3.38	16	59.2	<0.001

a placenta praevia and that difference was significant ($P < 0.001$). The incidence of placenta accreta with praevia was highest (59.2%) in patients with 2 or more prior CS (Table 1).

Although the incidence of placenta praevia was higher with increased age and parity there was no significant difference in age and parity distribution within the groups of placenta praevia, placenta

praevia with previous CS or placenta accreta. Those having placenta praevia with accreta and previous CS had the lowest mean gestational period, indicating a relatively early onset of significant bleeding in these cases.

Caesarean hysterectomy was performed for placenta praevia with severe postpartum haemorrhage in 3 (1.7%) of 175 patients with an unscarred

Table 2
Major complications related to placenta praevia

	No prior CS (<i>n</i> = 175)	Prior CS with placenta praevia but no accreta (<i>n</i> = 29)	<i>P</i> -value	Prior CS placenta accreta + praevia (<i>n</i> = 18)	<i>P</i> -value
Haemorrhage (transfusion > 5 units)	21 (12.0)	10 (34.5)	<0.01 RR 1.27	15 (83.3)	<0.001 RR 1.6
Disseminated intravascular coagulation (DIC)	2 (1.1)	3 (10.3)	NS	8 (44.4)	<0.001 RR 4.5
Intraoperative hypotension	3 (1.7)	6 (20.7)	<0.001 RR 2.6	9 (50.0)	<0.001 RR 3.63
Hypogastric artery ligation	4 (2.2)	4 (13.8)	NS RR 1.7	6 (33.3)	<0.001 RR 2.3
Hysterectomy	3 (1.7)	3 (10.3)	NS	12 (66.6)	<0.001 RR 4.5
Reexploration	Nil	Nil	—	3 (16.6)	—
Injury to urinary tract	Nil	Nil	—	3 (16.6)	—
Oliguria	Nil	Nil	—	2 (11.1)	—
Maternal death	Nil	Nil	—	1 (5.5)	—

Figures in parentheses are percentages.
NS, not significant; RR, risk ratio.

uterus, in 3 (10.3%) of 29 patients who had previous CS with placenta praevia, and in 12 (66.6%) of 18 patients who had previous CS with placenta accreta and praevia (Table 2). Bilateral hypogastric artery ligation was performed to control bleeding in 4 (2.2%) of 175 patients with an unscarred uterus, in 4 (13.8%) of 29 patients who had previous CS with placenta praevia and in 6 (33.3%) of 18 patients who had previous CS with placenta accreta and praevia (Table 2). There were significantly higher risks of haemorrhage, disseminated intravascular coagulation, hypotension, arterial ligation and hysterectomy in the group of patients with prior CS, placenta praevia and accreta as compared with the cases of placenta praevia with no prior CS or with prior CS but no accreta (Table 2).

One patient with a previous CS and placenta praevia and accreta died in this series. She was a 21-year-old, gravida 3, para 2 who had previously undergone two caesarean deliveries and was admitted at 24 weeks of gestation because of bleeding from placenta praevia. At 29 weeks of gestation she had sudden unprovoked torrential bleeding which necessitated emergency lower segment CS. An adherent placenta involving the area of the previous uterine incisions and the trigone of the urinary bladder was diagnosed during attempts at removal of the placenta. There was brisk haemorrhage and while subtotal hysterectomy and bilateral hypogastric artery ligation temporarily controlled bleeding, the patient suffered from intraoperative hypotension and died of cerebral anoxia and adult respiratory distress syndrome.

4. Discussion

The incidence of placenta praevia requiring caesarean section in the present series was 0.45%. Using the same criteria, Neilsen et al. [6] reported the incidence of placenta praevia to be 0.33%. Our higher incidence is probably related to the higher number of patients of high parity (para \geq 5), who accounted for 2% (824/41 206) of the obstetric population and 40.6% (89/222) of the patients with placenta praevia. The risk of placenta praevia in patients with previous CS (2.5%) was higher than

that found by Clark et al. (1%) [2] and Neilsen et al. (1.22%) [6] but lower than that reported by Singh et al. (3.9%) [7].

The frequency of low implantation of placenta diagnosed by ultrasound is about 5% in the second trimester and 0.3% at term [2,8]. This is explained by growth of the lower uterine segment and relative migration of the placenta upwards. The increased incidence of placenta praevia with a scarred lower uterine segment is probably due to failure of the differential growth of the scarred area resulting in a higher incidence of anterior placenta praevia at term [2].

The combination of a placenta praevia and accreta with previous CS was 38.2% comparable with the 35% reported by Clark et al. [2] but 16% by Neilsen et al. [6]. The higher proportion of placenta accreta with previous CS in our series is considered to be related to the increasing awareness of the condition, the diagnostic criteria being mainly clinical, and the prospective nature of the study probably made us more perceptive of the diagnosis. Histological documentation of the abnormal implantation is desirable but cannot be obtained without hysterectomy [9]. The inclusion of cases without microscopic documentation but with a strong clinical picture of placenta accreta was considered important by Fox [10] in order to reflect the true incidence and spectrum of the disease. We suspect that hospital case notes in the past were not critical in differentiating praevia from accreta. The specific risk of placenta accreta in patients with both previous CS and placenta praevia is a relatively newly recognised phenomenon. The risk appears to rise with increasing numbers of previous uterine incisions [2,7]. The present series revealed a higher incidence of placenta accreta in patients with two or more previous CS (59.2%) compared with patients with one previous CS (10%). This association of placenta praevia and accreta with scarred lower uterine segment is generally explained by the virtual or complete absence of decidua basalis over the uterine scar.

This combination of placenta praevia and accreta with previous CS was particularly sinister since it involved caesarean hysterectomy in 10.3% of cases of praevia and 66.6% of accreta; this was

in spite of the fact that obstetric hysterectomy in Saudi Arabia was generally a draconian decision because of social conservatism. The risk of a caesarean hysterectomy in placenta praevia with previous CS is significantly increased because of significant haemorrhage or presence of placenta accreta [6]. The overall reported incidence of hysterectomy for placenta accreta was 64% [11]. The combination of placenta praevia or accreta with previous CS necessitated measures such as massive blood transfusion and hypogastric artery ligation, and was associated with one maternal death, and 9 near maternal deaths in our series. Placenta accreta is justifiably feared as one of the most serious of maternal complications; five out of six maternal deaths in Hibbard's [12] series of placenta praevia were directly attributed to this condition. Sturdee and Rushton [13] found the combination of a previous CS and anterior placenta praevia particularly risky; 37% (6/16) patients of placenta accreta had previous CS. In the series of Clark et al. [2] 82% (14/17) of patients who had placenta praevia accreta with previous CS underwent hysterectomy.

Ultrasonography and, more recently, magnetic resonance imaging (MRI) are reasonably precise in localizing the placental site, but the diagnosis of placenta accreta prior to delivery is speculative. Lack of sonolucent area beneath the implantation site during ultrasonographic examination may be suggestive of placental invasion [14]. An inability to antenatally distinguish placenta praevia from placenta accreta by current techniques justifies increased vigilance and forewarning of the patient in all such cases and ensuring that both appropriately experienced staff and blood for transfusion are available.

With the realization that a placenta praevia is particularly dangerous when implanted on a lower uterine scar, it is prudent to reclassify placenta praevia, in order to highlight the increased risk, as follows:

- (i) *Placenta praevia*: without uterine scar or with scar but placenta clearly posterior.
- (ii) *Pernicious placenta praevia*: where placenta overlies scar (i.e. anterior) one may or may not be accreta.

In view of the risks associated with pernicious placenta praevia we conclude that these women should be managed with appropriate precautions. They need:

- (a) elective caesarean section;
- (b) an experienced surgical team lead by a senior obstetrician and an anaesthetist;
- (c) experienced assistants who have the expertise to deal with major surgery including caesarean hysterectomy; and
- (d) prior activation of the support services such as pathology, blood transfusion, resuscitation, and intensive care team.

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