

Vaginal cesarean section: heir to, but not legacy of Dührssen's incision

Philippe Kadhel · Teddy Toto · Eustase Janky

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Abstract

Purpose Vaginal cesarean section is a uterine incision technique derived from Dührssen's incision, with which it is sometimes confused. We report here our experience over 10 years with this technique, with the aim of defining the situations in which it is potentially useful.

Methods We retrospectively analyzed 24 cases of vaginal cesarean section (i.e. cervico-segmental incision) carried out from 2002 to 2011 in our tertiary maternity unit. This corresponds to an incidence of 1.1 per thousand deliveries. The main outcome measures were the indications and complications of vaginal cesarean section.

Results The study population included 42 % nulliparous women. The fetuses concerned had a median gestational age of 24 weeks + 5 days (18 to 34 weeks + 1 day) and a median weight of 595 g (340–1,250 g). The indications for vaginal cesarean section were severe maternal morbidity in 54.2 % of cases, failed labor induction in 29.2 % and another indication in 16.7 %. All but one of the fetuses were dead or nonviable. Surgical complications were observed in three cases: two difficulties achieving hemostatic control and one bladder injury.

Conclusions Vaginal cesarean section is sometimes considered obsolete, but it has several advantages: technical

simplicity, limited tissue dissection, low risk of hemorrhage and no abdominal scar. These features make it particularly suitable for the extraction of medium-sized dead or nonviable fetuses when pharmacological options are ineffective or not rapid enough in cases of poor maternal condition.

Keywords Dührssen's incision · Intra-uterine fetal death · Maternal salvage · Vaginal cesarean section

Introduction

Vaginal cesarean section (VCS) is essentially a large cervical incision extending to the lower segment of the uterus. It may therefore be seen as a derivative of the technique known as Dührssen's incision, which was first described in 1890 [1, 2]. Dührssen's incision is sometimes referred to as hysterostomy. The use of Dührssen's incision was not particularly unusual in the first half of the 20th century [3–6], but it is now restricted to exceptional obstetric situations described in case reports [7, 8]. Improvements in the techniques used for conventional abdominal cesarean section and their safety seem to account for the decreasing popularity of Dührssen's incision.

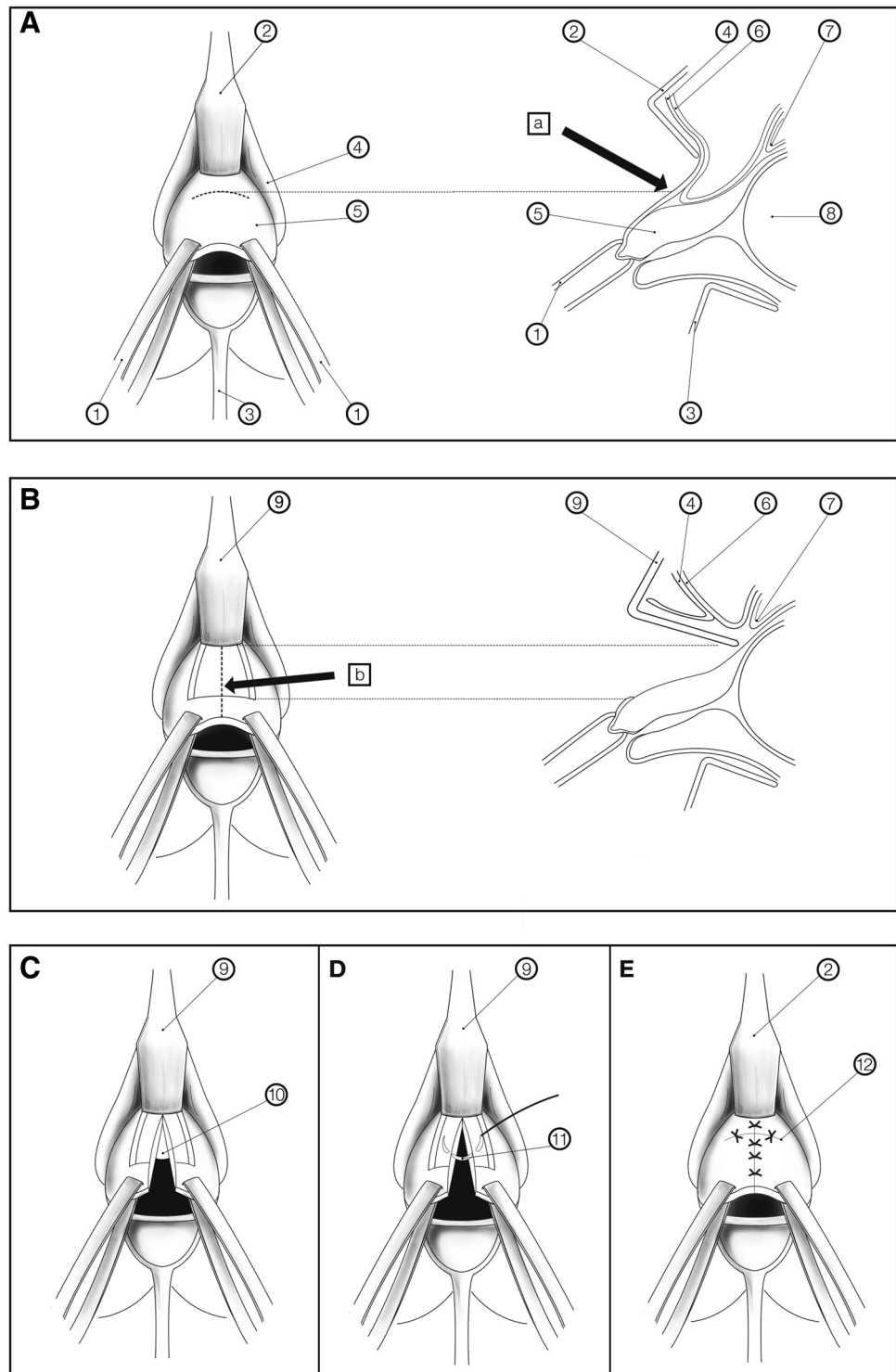
Vaginal cesarean section also involves an incision of the cervix, but not limited to its vaginal portion. This technique, attributed to F. Schauta [9, 10] was promoted in France by Malinas as early as 1957 [11] and has been used since the 1960s [9–14]. It is little used and often considered obsolete. To our knowledge, VCS has only ever been described in French publications.

In this study, we aimed to present the results obtained with VCS in our obstetrics department and to outline the potential field of application of this extraction procedure.

P. Kadhel (✉) · T. Toto · E. Janky
Pôle Parent-Enfant, Service de Gynécologie et Obstétrique,
Centre Hospitalier et Universitaire de Pointe-à-Pitre/Abymes,
Route de Chauvel, BP 465, 97159 Pointe-à-Pitre Cedex,
Guadeloupe, France
e-mail: philippe.kadhel@orange.fr

P. Kadhel
Institut National de la Santé et de la Recherche Médicale
(Inserm) U1085-IRSET, Université des Antilles et de la Guyane,
Campus de Fouillole, 97110 Pointe-à-Pitre, Guadeloupe, France

Fig. 1 Description of the main steps in vaginal cesarean section. **A** Anterior colpotomy. 1 Tenaculum, 2 vaginal retractor in the anterior vaginal fornix (fornix vaginae), 3 vaginal retractor in the posterior vaginal fornix (fornix vaginae), 4 vagina, 5 anterior wall of the cervix, 6 bladder (vesica urinaria), 7 vesico-uterine pouch (excavatio vesicouterina), 8 fetus, *a* position of the semicircular incision of the vagina at the supra-vaginal septum level. **B** Vesico-uterine space cleavage. 9 The vaginal retractor is now in the vesico-uterine space, exposing the uterus from the external os of the cervix to the vesico-uterine pouch. The anterior vaginal wall and the bladder are pushed upwards by this retractor, *b* position of the vertical cervico-segmental incision of the uterus. **C** Anterior vertical cervico-segmental incision from the external os of the cervix to the vesico-uterine pouch without the opening of this pouch. 10 The fetus can now be extracted. **D** Reconstruction of the cervico-segmental incision. 11 Reconstruction of the uterus by separated stitches from the vesico-uterine pouch to the external os of the cervix, with a using a 0 long absorbable suture. **E** Total anterior cervix wall reconstruction and colporrhaphy



Materials and methods

We carried out a retrospective 10-year study at the University Hospital of Pointe à Pitre in Guadeloupe (French West Indies). It is a hospital with a tertiary maternity unit dealing with high-risk pregnancies and equipped with

neonatal intensive care facilities. From 1st January 2002 to 31st December 2011, 24 cases of delivery by VCS were identified by the manual checking of operating room registers. All the corresponding medical files were read, to extract the required information. The technique used in our unit, presented in Fig. 1, can essentially be summed up as

Table 1 Characteristics of the 24 cases of vaginal cesarean section

	Value	Range
Median age of the patients (years)	29	15 to 40
Nulliparous patients (%)	42	–
Patients with scarred uterus ^a (%)	8.3	–
Lower uterine segment expanded (%)	25	–
Median gestational age (weeks + days)	24 + 5	18 to 34 + 1
Anesthesia (%)		
General ^b	87.5	–
Spinal locoregional	12.5	–
Fetus presentation (%)		
Breech	62.5	–
Cephalic	20.8	–
Not specified	16.7	–
Median fetal weight (g)	595	340 to 1250
Median biparietal diameter (mm)	65.5	45 to 83
Antibiotic prophylaxis during surgery (%)	100	–
Maternal infection (%)	0	–
Maternal death (%)	0	–

^a Prior abdominal cesarean delivery

^b General anesthesia performed because of the emergency context and, in some cases, due to a coagulation defect contraindicating locoregional anesthesia

an opening of the anterior vaginal fornix and dissection of the vesico-uterine space. This leads to bladder detachment, allowing a median cervical incision in the 12 o'clock position. In this way, the apex of the cervical incision can reach the upper limit of the lower uterine segment, resulting in a vertical cervico-segmental incision of the uterus [9–14].

Results

During the study period, 20,728 births took place at our hospital, among which, we identified 4,489 abdominal cesarean Sections (21.6 %) and 24 VCSs (1.1 per thousand). The characteristics of these cases are presented in Table 1.

The indication for VCS was severe maternal morbidity requiring emergency extraction of the fetus in 13 patients (54.2 %; 7 cases of HELLP syndrome, 3 cases of placental abruption including one case of association with placenta previa, 2 cases of eclampsia and 1 case of acute fatty liver of pregnancy). The indication was labor induction failure in seven cases (29.2 %). The other indications (16.7 %) recorded were: 1 case of head entrapment, 1 case of placenta previa, 1 case of chorioamnionitis and 1 case of cord prolapse. In all but one of the cases of VCS, the fetus was dead or nonviable, in terms of the possibilities for neonatal

resuscitation. The exception was a delivery at 26 weeks of gestation (WG) complicated by an extended umbilical cord prolapse with signs of prolonged anoxia, as suggested by extreme bradycardia on admission. This newborn died at the age of 2 days, in a context of hypoxic brain injury.

An obstetric maneuver was required for fetal extraction in 20 cases (83.3 %). A total breech extraction was performed in 15 cases, associated with craniotomy in one case, and five cephalic extractions were performed with instruments. For the four remaining cases, the type of extraction was not specified.

Surgical complications occurred in three cases (12.5 %). In two interventions (8.3 %), hemostatic control of a tear at the upper angle of the VCS was difficult. Laparotomic conversion and blood transfusions were required in these cases. The third complication was a bladder injury (4.2 %) treated without sequelae via the vagina and requiring urinary catheterization for 10 days. In total, six cases (25 %) required a blood transfusion, including four patients who had blood transfusions for anemia before surgery. Mean hemoglobin concentration was 8 g/dl (range 4–12 g/dl) and 50 % of the patients had hemostatic abnormalities, such as thrombocytopenia or coagulation protein disorders, before VCS.

Discussion

We report here a series of surgical interventions carried out with a technique often considered old-fashioned and out of place in modern obstetrics. This view is not entirely unjustified, particularly when the VCS is associated with maneuvers such as craniotomy. However, we believe that it is still useful in the particular situation of fetal death requiring emergency extraction of the fetus due to the condition of the mother. This technique can be considered a valid alternative to abdominal cesarean, which frequently requires corporeal incision of the uterus for mid-trimester fetal extraction.

Dührssen's incision was the original technique of this type. It involved a double or triple cervical incision limited to the vaginal portion of the cervix [1, 2, 5], with the aim of achieving a situation equivalent to complete cervical dilatation. In the VCS technique that we use, there is a single cervical incision, extending to the lower segment of the uterus [9–14]. These technical differences may also account for the differences in indication between these two techniques. Dührssen's incision was proposed as a technique for facilitating the vaginal delivery of live fetuses [1, 2, 4, 6]. The VCS can be carried out with or without the onset of labor and for preterm pregnancies. The aim of this technique is to obtain an opening sufficiently large for the expulsion of small or medium-sized dead or nonviable

fetuses [9–11, 13, 14]. It has been estimated that the VCS incision yields an opening with a circumference of 26 cm [11], corresponding to a diameter of around 8 cm.

The declining use of Dührssen's incision reflects the limited indications for this technique, due to improvements in the safety of abdominal cesarean sections. Recent descriptions of its use have been limited to case reports [7, 8] dealing with very exceptional obstetric situations, such as delivery associated with uterus prolapse [8]. This loss of interest in Dührssen's incision and confusion with VCS techniques apparent in some publications [11] have probably decreased or entirely eliminated interest in the use of VCS. This is unfortunate, in our opinion, because VCS is potentially useful in certain problematic obstetric situations. It is difficult to estimate the current incidence of VCS as performed in our unit, due to the lack of published series. Our results suggest that the potential incidence of VCS could be estimated at about one per thousand.

In most publications, maternal salvage is identified as a good indication for VCS [10, 14]. However, as pointed out above, such indications must be associated with the death or nonviability of the fetus for full justification of this mode of extraction [14]. In our series, this situation was encountered in more than half the cases. There are also good indications for VCS when the rapid extraction of a dead fetus is required in situations of cervical dystocia. Such situations may arise in the context of fetal death in utero or the termination of a second trimester pregnancy due to fetal abnormality. However, this risk of a failure to achieve complete cervical dilatation may decrease with the use of misoprostol alone or in combination with mifepristone for the induction of labor during the second trimester [15].

In the only case of VCS performed on a living fetus in our series, the procedure was performed for the management of an umbilical cord prolapse that occurred at 26 WG at the patient's home. This case was justified by a convergence of several factors: the extreme prematurity of the fetus, its extremely poor prognosis given the prolonged anoxia suspected on the basis of the chronology of events and confirmed by the extreme bradycardia observed on admission and, finally, the experience of the surgeon in charge, making it possible to extract the fetus at least as rapidly as by abdominal cesarean section. This technique provided a valid option in this very particular situation, but, in our opinion, its use for the delivery of live fetuses should nevertheless be considered exceptional and limited to experienced physicians.

Cephalopelvic disproportion appears to be a more important and absolute limitation of VCS for several authors [10, 14]. However, this situation is highly unlikely before the third trimester and was not encountered in any of our cases. It has been suggested that VCS should be limited to fetuses with a gestational age of less than 32 WG and a

weight of less than 1,500 g [10], or to fetuses weighing less than 2,500 g and with a biparietal diameter of less than 80 mm [14]. Consequently, anatomic features, including, in particular, the degree of expansion of the lower uterine segment, should be taken into account as a potential limitation for the indication of VCS. Indeed, the relationship between the volume of uterine content to be extracted and the expected length of the incision should be evaluated, given that greater expansion of the lower uterine segment is associated with a longer VCS incision. In our study, only a quarter of the cases were considered to display good expansion of the lower segment of the uterus. Nevertheless, if non-optimal expansion of the lower uterine segment may lead to increase of: surgical difficulties, duration of surgery, likelihood of instrumental extraction and risk of complications, it should therefore be considered a relative contraindication for VCS [10, 14].

Hemorrhage and bladder injury were the only complications of VCS observed in this series. Hemorrhage appears to be the most frequently described complication [10, 14]. In general, it is due to the pathological situation (e.g. hemostatic abnormalities) resulting in the indication for VCS rather than the intervention itself. The median line of the cervix and the lower segment of the uterus appear to be less anastomotic and, thus, less hemorrhagic [10, 11, 14]. Indeed, VCS appears to be associated with a lower frequency of hemorrhage than the abdominal approach [10, 14]. In our series, the only hemorrhagic situation that could be attributed to the procedure was related to a tear of the incision. Similar situations have been described before [14]. The reported incidence of bladder injury is about 5 % [10], as in our series. These injuries are generally related to cervical tears extending to the bladder during fetal extraction [10]. This extension to the bladder wall is itself linked to an insufficiently long cervico-segmental incision. As in our case, it may also be linked to the dissection of the vesico-vaginal space required for the VCS incision technique we use. Provided that this complication is diagnosed at the time of the procedure, its treatment seems to be easy and effective. Conversely, a lack of detection at the time of the intervention may lead to more serious complications, such as vesico-vaginal fistula, which can be difficult to treat. Consequently, the use of methylene blue staining is recommended if doubt arises during a VCS procedure.

With the exception of the intraoperative complications mentioned above, no other specific complication of VCS has been described. The management of the postoperative period seems to be similar to that for vaginal delivery or expulsion, probably due to the extraperitoneal nature of the procedure and the limited tissue dissection. It would have been interesting to compare our VCS series with abdominal cesareans in the same clinical situations. However, no such control group is available at our institution.

Vaginal cesarean section has the advantage over abdominal cesarean section of leaving no abdominal scar. In addition, VCS is not considered to have scarred the uterus during follow-up for subsequent pregnancies [10]. This technique does not, therefore, decrease the possibility of subsequent vaginal deliveries in the way that abdominal cesarean section does in cases of mid-trimester fetal extraction, due to the frequent requirement of a corporeal incision of uterus. The more limited tissue dissection and section than for abdominal cesarean section are particularly valuable for patients with hemorrhagic syndromes or other critical health conditions. These features also facilitate care during the postoperative period, which differs little from that for vaginal delivery.

Very little is known about the long-term complications of VCS. Cervical incompetence or dystocia and cervical endometriosis have been suggested [10]. Unfortunately, these complications have never, to our knowledge, been quantified.

The indications proposed for VCS are rare. This appears to be a limitation to the learning and spread of this technique. However, this technique is simple to perform and requires no specific instrumentation (Fig. 1). It can easily be implemented by gynecologists accustomed to vaginal surgery, such as hysterectomy. In the absence of such experience, abdominal cesarean section remains a safer solution.

In conclusion, VCS may appear outdated in the context of the increasing efficiency of pharmacological labor induction and safety of abdominal cesarean section. This is particularly true given the frequent confusion between this technique and Dührssen's incision, of which it could be considered the heir. Nevertheless, some of the features of this technique make it particularly useful in certain critical situations. In particular, VCS is potentially useful for the extraction of dead or nonviable fetuses weighing less than 1,500 g or before a gestational age of 32 weeks. The use of VCS can be considered when the pharmacological induction of labor fails or is unlikely to result in a rapid enough extraction given the deteriorating condition of the mother. The simplicity of this technique makes it easy to learn and to perform by most obstetricians and gynecologists, without the need for sophisticated technical equipment.

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Conflict of interest The authors report no conflict of interest.

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