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Profile of Pregnant Women and Success of the Uterine Test on a Uni- or Bi-Scar Uterus at the Maternity Ward of Panzi Hospital, in the Democratic Republic of the Congo

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Abstract

Introduction: Trial of labor after a previous cesarean section (TOLAC) is a method that requires strict monitoring to decrease the cesarean section (CS) rate and improve the maternal and neonatal prognosis. The objective is to determine the profile and outcome of patients with one and two previous CSs who performed TOLAC at Panzi General Referral Hospital. **Methodology**: This is a cross-sectional study with a prospective collection of data of 111 patients with one and two previous CSs at Panzi Hospital from January 2021 to August 2022. Statistical Package for the Social Sciences SPSS version 23 software was used to analyze the collected data. The percentages of categorical variables were summarized in a frequency table. The mean or median with standard deviation was used to summarize quantitative variables. **Results**: The overall success rate of the TOLAC was 64%, with 63.8% following one previous CS and 64.3% following two CSs. The mean age of the patients was 27.09 years, with an age range of 25 - 34 years. They were mostly pauciparous (52.2%), married (88.3%), with a high school education (60.4%). The inter-delivery interval > 18 months was noted (64.1%) and overweight in 63.9%. More than three antenatal consultations were performed (58.6%). We found a mean gestational age of 38 (34 - 41) weeks. The perinatal mortality rate was 0.9%. However, we did not record any cases of maternal mortality during the study period. **Conclusion**: TOLAC after one and two previous CS is imple-

mented in the maternity Unit of Panzi Hospital for well-selected patients. In addition, the success rate is similar after TOLAC with an acceptable maternal-neonatal prognosis.

Keywords

One Previous Caesarean, Panzi General Referral Hospital, Trial of Labor after Cesarean Section, Two Previous Caesarean, Vaginal Birth after Cesarean Section

1. Introduction

In the last two decades, the rate of caesarean sections has increased overall. One of the consequences is the increase in the number of patients with history of previous cesarean section (CS) [1], the main cause of morbidity is uterine rupture [2]. The management of a vaginal delivery after a CS is one of the most debated topics in modern obstetrics. Up to two caesarean sections, some authors tend to favor elective cesarean section [1]. Others advocate trial of labor after cesarean section (TOLAC) if specific parameters are favorable.

Nowadays, it is known that maternal and infant morbidity increases simultaneously with the number of caesarean sections [3]. Despite the progress in obstetric practice and safer anesthesia to offer better maternal-fetal safety during CS, the rates of maternal complications remain high, sometimes putting at risk the obstetrical outcome of the patients [4].

The recommendations made by the American College of Obstetricians and Gynaecologists (ACGO) [5], the Society of Obstetricians, Gynaecologists of Canada (SOGC) [6] and the Royal College of Obstetricians and Gynaecologists (RCOG) [7], emphasize that TOLAC is a reasonable option. It must consider the obstetric characteristics of the patient, their willingness to perform the trial, the place of delivery and the equipment and staff of the maternity ward, the qualifications of the nursing staff, and obstetric practices.

Current studies agree on the benefits of the vaginal delivery after a CS in terms of reduction of maternal and infant morbidity and overall healthcare savings. In developing countries, practitioners in the obstetric unit are confronted with this reality of women with previous CS willing to attempt a vaginal delivery [8] [9]. According to the WHO, if the conditions allow it, they can benefit from the trial of labour to have a positive experience of childbirth [10], so this should be done in a facility capable of handling obstetric emergencies [9]. In medium- and low-resource countries, trial of labour after CS can reduce maternal and infant morbidity [1] [8]. In our department, eligibility criteria for trial of labour are established on a checklist to select and evaluate patients with previous CS. The aim of the present study in our series is to determine the profile of patients with a history of one and two previous CS eligible for trial of labour, the success rate as well as complications at Panzi General Referral Hospital.

2. Material and Methods

2.1. Criteria Include

All parturients with a single segmental or bi-scared uterine scar with or without proven spontaneous induction of labor (active phase), a softened, axial, and 50% effaced cervix, a single fetus in apex presentation (fetal accommodation), a uterine height < 34 cm (exclude macrosomia on ultrasound ≤ 3500 grs), a scar thickness > 35 mm on a clinically or radiologically normal pelvis.

After prior screening and follow-up during prenatal consultations, these patients are usually oriented on the delivery route and or possible uterine test.

We used a non-exhaustive sample of 111 pregnant women with one or two uterine scars who delivered at Panzi Hospital during the study period.

Several variables were considered for the realization of this study, the socio-demographic aspect including the age of the pregnant woman, the level of education (none, primary, secondary, university), the marital status (widow, married, single), the profession (housewife, civil servant, shopkeeper, student).

Obstetrical history considered were gravida (paucigest, multigeste), para (primiparous, pauciparous, multiparous), number of ANC (≤1, 2, ≥3), number of previous cesarean sections (1, 2), number of previous vaginal deliveries, previous indications), parameters related to the course of delivery including (gestational age, mode of admission (referral, single arrival), factors of success of uterine test in patients with uni- and bi-cicatricial uterus (age group, gestational age, para, intergenital interval, age of pregnancy, surgical history, delivery mode, ANC, number of previous caesarean sections), water pocket (intact, ruptured), type of rupture (none, early, untimely), height of the uterus, size of the uterus, etc, early, untimely),uterine height (<28 cm, 28 - 33 cm, >33 cm), cervical dilatation (1 - 3, ≥4), Neonatal prognosis associated with successful uterine testing in parturients with uni- and bi-scarred uteri: neonatal sex, birth weight.

2.2. Study Design

This is a cross-sectional study of patients with a history of one and two previous CS who underwent TOLAC from JANUARY 1, 2021 TO OCTOBER 31, 2022.

2.3. Study Setting

The study was conducted at Panzi General Referral Hospital located in the city of Bukavu, South Kivu province in The Democratic Republic of the Congo. It is a referral facility in Ibanda health zone covering a population of 511,396 inhabitants and receiving patients referred from 28 hospitals and 24 health centers. In addition, it is a university hospital where general practitioners, gynecologists and midwives are trained. Approximately 3000 deliveries are carried out each year with a caesarean rate of 32%.

2.4. Sampling

We used a non-exhaustive sample of 111 pregnant women with history one and

two CS who delivered at Panzi Hospital maternity ward during the study period.

2.5. Data Collection Tool

Upon arrival in the delivery room, eligible women gave their consent to participate in the study. Immediately, the study parameters were collected as the patient progressed through labor and delivery. We used a pre-established questionnaire to collect the patient's details, the obstetric records of the patients, the delivery register, the partogram and the follow-up records of the Mothers and newborns. Data collection was carried out by the midwives, trainee doctors and residents in the department respecting the principles of confidentiality.

2.6. Study Variables

Several variables were considered for this study. The socio-demographic aspect including the age of the pregnant woman, the level of education (illiterate, primary, secondary, university), the marital status (widow, married, single), the profession (household, state employee, trader, pupil/student), ethnicity (Bembe, Fuliru, Havu, Lega, Lenge, Shi, Batembo). The obstetrical history considered the gravidity, the parity, the number of antenatal consultations (ANC) (≤1, 2, ≥3), the number of previous cesarean sections (1, 2), the number of previous vaginal deliveries, previous indications), the gestational age and the mode of admission (referral, alone), We have considered the newborn prognosis by assessing the AGPAR score (>7, <7) and the maternal complications after TOLAC.

2.7. Data Management and Analysis

The collected data were typed using Microsoft Excel 2013 and analyzed by SPSS version 23 software. Categorical variables were summarized as a frequency table with their percentages. Quantitative variables were summarized by the mean and their deviation standards or the median and its deviation domains depending on whether the distribution was symmetric or not.

2.8. Ethical Considerations

This research was designed and carried out in accordance with the Declaration of Helsinki (1996), and approved by the National Health Ethics Committee and registered under number: CNES 001/DPSK/191PP/2022.

3. Results

A total of 111 patients were enrolled and considered for this research. Their average age was 27.09 (±5.02) years, more than half of them were between 25 - 34 years. Regarding the religion, we noted that 52% of patients were Protestants, followed by 26% Catholic. 60% of women were from Ibanda zone.

Most of the patients were married (88.3%), 78.4% were household and 10.8% were employees. 60% of patients had a secondary education and 15.3% were University graduates (**Table 1**).

Table 1. Socio-demographic characteristics of patients.

Parameters	N = 111 (%)	Average (±SD)
Age group (years)		
≤24	37 (33.4)	
25 - 34	62 (55.8)	27.09 (±5.02) years
35 - 44	12 (10.8)	
Religion		
Protestant	58 (52.3)	
Catholic	29 (26.1)	
Brahanamist	9 (8.1)	
No religion	8 (7.2)	
Muslim	5 (4.5)	
Revivalist	2 (1.8)	
Background of origin		
Ibanda	67 (60.4)	
Kadutu	16 (14.4)	
Out of town	16 (14.4)	
Bagira	8 (7.2)	
Outside the province	4 (3.6)	
Marital status		
Married	98 (88.3)	
Single	11 (9.9)	
Widowed	2 (1.8)	
Profession		
Housewife	87 (78.4)	
State employee	12 (10.8)	
Businesswoman	8 (7.2)	
Pupil/student	4 (3.6)	
Education		
Illiterate	16 (14.4)	
Primary	11 (9.9)	
Secondary	67 (60.4)	
Higher education	17 (15.3)	
Spouse's profession		
Businessman	37 (33.3)	
Civil servant	32 (28.8)	
Household	37 (33.3)	
Teacher	5 (4.5)	

*SD: Standard deviation; **Min: minimum; ***Max: maximum.

The patients' ethnicity distribution showed that most women were Shi, followed by Lega and Fuliru with 71.2%; 8.1%; 5.4% respectively (Figure 1).

Regarding the obstetric history of women (Table 2), the pauciparous represented more than half (52.2%), 54.1% had a living child and 10% had already lost children (deceased). We also noted that 7.2% with an inter-delivery interval equal to 18 months, 63.9% were overweight and 10.8% were underweight. Eight percent of the parturients had performed only one ANC session during the pregnancy and 58.6% had performed more than three ANC sessions. We found that the average gestational age of pregnancy was 38 (34 - 41) weeks gestation and in the majority 74, 8% of the cases, the gestational age was between 37 weeks of gestation.

The mean uterine height of the woman was 31 (22 - 39) cm and most of them had a uterine height from 28 to 33 cm.

Overall, the success rate of TOLAC in women with both history of one and two CS (s) was 64% versus a failure rate of 36% (Figure 2). We noted that

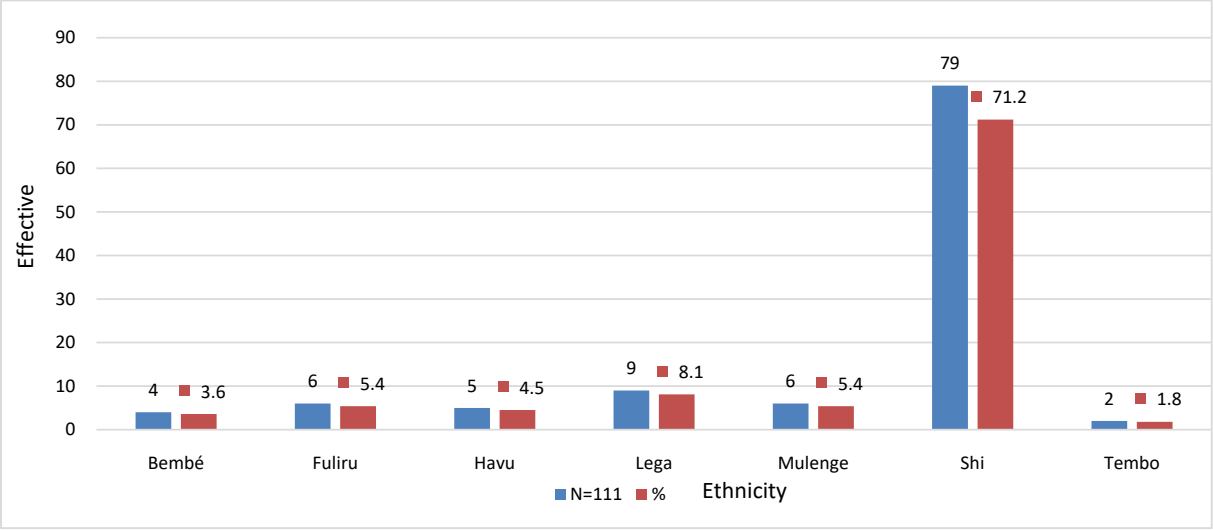

Figure 1. Patients ethnicity.

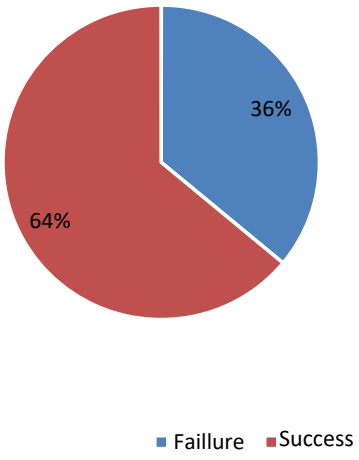

Figure 2. Prevalence of TOLAC success rate.

Table 2. Obstetrical history of patients.

Parameters	N = 111 (%) Mean (±SD)
Age range (years)	
≤24	37 (33.4)
25 - 34	62 (55.8) 27.09 (±5.02) Years
35 - 44	12 (10.8)
Religion	
Protestant	58 (52.3)
Catholic	29 (26.1)
Brahanamist	9 (8.1)
Secular	8 (7.2)
Muslim	5 (4.5)
Awakening church	2 (1.8)
Place of origin	
Ibanda	67 (60.4)
Kadutu	16 (14.4)
Out of town	16 (14.4)
Bagira	8 (7.2)
Out of province	4 (3.6)
Marital status	
Married	98 (88.3)
Single	11 (9.9)
Widow	2 (1.8)
Parturients' occupation	
Housewife	87 (78.4)
Civil servant	12 (10.8)
Trader	8 (7.2)
Pupil/Student	4 (3.6)
Education level	
Illiterate	16 (14.4)
Primary	11 (9.9)
Secondary	67 (60.4)
University	17 (15.3)
Spouse' occupation	
Trader	37 (33.3)
Civil servant	32 (28.8)
Household	37 (33.3)
Teacher	5 (4.5)

TOLAC following one and two previous CS(s) was similar with 63.8% (n = 44/69) and 64.3% (n = 27/42) respectively (Table 3). 52.3% of newborns were female versus 47.7% male. Concerning the fetal prognosis, we noted neonatal asphyxia in 6.3% of the newborns who were resuscitated in neonatology, 3.6% had low birth weight and there was one neonatal death (Table 4).

Among the 40 cases of failed TOLAC, there were 11 cases (27.5%) of Adhesions in the abdominal cavity, 9 cases (22.5%) of delivery hemorrhage. Of the 71 successful TOLAC cases, 8.5% had placental retention, 2.8% had perineal tears and 1.4% had cervical tears. During this study period, there were no cases of maternal death.

4. Discussion

From patients selected for TOLAC during the study period, 62% had one previous CS, compared to 38% of those with two previous CS. Overall, the success rate of the TOLAC in the maternity ward of the Panzi General Referral Hospital was 64%, of which 63.8% was in women with one previous CS and 64.3% after two CSs.

Table 3. TOLAC according to the number of previous cesarean section.

Number of previous cesarean section	Success	Failure
1	44 (63.8)	25 (36.2)
2	27 (64.3)	15 (35.7)

Table 4. Neonatal parameters.

Parameters	N = 111 (%)	Median (min-max)
Sex of newborns		
Female	58 (52.3)	
Male	53 (47.7)	
Apgar at 5th minute		
<7	7 (6.3)	10 (4 - 10)*
≥7	104 (93.7)	
Birth weight (grs)		
<2500	4 (3.6)	
2500 - 4000	103 (92.8)	3200 (1900 - 4500)*
>4000	4 (3.6)	
Height (cm)		41 (35 - 52)*
Resuscitated neonate (<20 Min)		
No	104 (93.7)	
Yes	7 (6.3)	
Neonatal death		
No	110 (99.1)	
Yes	1 (0.9)	

Regarding the socio-demographic characteristics, the findings show that the majority of patients in this study were between 25 and 34 years old (55.8%), which was similar to the result found by Parveen [11] in his study found that the maternal age under 30.5 years was a factor of success TOLAC. Similarly, Rozenberg [12] found a mean age of 27 years among women who had TOLAC.

This is explained by the fact that younger age would contribute to the success of TOLAC because it is the age of reproductive activity. The financial accessibility is a real problem. Koh [13] has recently showed that salaried state employees and traders represented 92% of pregnant with improved quality of follow-up during the pregnancy.

Our findings show a high rate of educated women than was reported by some authors. Fouelifack, [14] found 58.30% while Dembélé *et al.* [15] reported 49.10% of their patients with no formal education.

We found that pauciparous represented 52.2% and multiparous 44.2% of cases. This can be explained by the fact that in South Kivu, the high number of multiparous women is explained by the high number of pregnancies among women (fertility index: 5.5) as well as the low contraceptive prevalence (11% according to EDSM V) [16]. This result is correlated to that of Haumonté [17] who found parities of 1 - 12 respectively.

Most of the pregnant women were overweight with 63, 9% in contrast to Thachinamurthi [18] who found that failure of the labor trial was correlated with weight gain during pregnancy. The finding of a higher probability of caesarean section for a weight at the end of pregnancy between 66 and 80kg compared to a weight above 80 kg, could be explained by excessive weight gain in the first subgroup of women.

In our research population, we have also observed an inter-delivery interval > 18 months (96%), which is in agreement with the result found in a similar study conducted in our setting [19]. This is a reassuring factor to prevent uterine rupture in a scarred uterus.

Our study shows a high success rate of the TOLAC after one and two previous CS. This rate is within the recommended range of 60% - 85% of TOLAC [20]. The success result was similar following one previous CS (63.8%) and two previous CS (64.3%). Other surveys have shown a reassuring rate of successful TOALC. The success rate of uterine test in China is 84.0% [21] and 72% in Germany [22]. These authors believe that TOLAC is a possible strategic approach to decrease the rate of CS.

In this study, 58.6% of our patients had undergone more than three ANC sessions, which is recommended by the national protocol. Because the focused prenatal consultation allows for early detection and treatment of maternal-fetal morbidities, health promotion, during which complications associated with a scarred uterus could be discussed, and the delivery plan, which indicates the most appropriate place for delivery, the competent provider who should take charge of delivery in a scarred uterus, etc. This rate is explained by the fact that

in our service, there is an ANC unit that is also in charge of pregnancy follow-up counseling. A list of high-risk pregnancies whose follow-up requires a specialized setting. Our rate of antenatal consultations is correlated to the findings of Mapatano [23] who found 85.23% of ANC and Baldé [24] 83.90%. The success rate of TOLAC was 63% for women with one previous CS and 64% for those with two CS. There was no maternal death in this study comparable to the results found by Spaans [25] who found 71.4% and 84% for Nathan S [26]. This similarity in our study is explained by a good selection of these patients and their consultation during antenatal consultations. In addition to these elements the psychological follow-up and the skills of the practitioners in the delivery room.in this study, there were fewer fetal complications and the risk of perinatal death during the uterine test was low. Some authors, in fact, consider that there is more morbidity in the group of failed vaginal delivery.

Patients with a history of one and two cesarean sections can benefit from TOLAC when they are properly selected. In addition, rigorous monitoring of labor is a supportive element for the success of TOLAC. In this way, women in low-income countries would benefit from this approach, which aims to reduce the rate of cesarean sections and improve maternal-neonatal prognosis.

This study has determined the characteristics of patients with a history of one and two CS who underwent a TOLAC labor trial in a level III maternity hospital. It is part of a series of our research. Nevertheless, it has some limitations, including its sample size and single-center focus. Future controlled studies are essential to evaluate this finding.

5. Conclusion

In the maternity unit of Panzi general referral hospital, TOLAC is performed on selected patients with a profile of one and two previous CS(s). The success rate of TOLAC in women with one and two previous CS is similar. The proper selection of patients, their willingness to perform the labor, and the skills of the obstetrician team promote the success of TOLAC. In addition, it should be performed in a facility with the capacity for dealing with maternal-neonatal emergencies. Therefore, education and sensitization of pregnant women with scarred uterus, as well as access to obstetric care, would enhance the safety of both women and the health care providers.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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