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Fetal Instrumental Extractions at the Maternity Section of the Dakar Nabil Choucair Health Centre (Senegal) in 2017: Epidemio-Clinical Aspects, Indications and Prognosis

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Abstract

Introduction: An instrumental extraction is performed in order to shorten the phase of expulsion of the fetus outside the maternal pelvic pathway, when there is a suspected fetal state or a defect in progression of the fetal mobile. It can be responsible for immediate or late maternal complications, which are not specific because they can occur after a normal delivery. The objectives of this work are to describe the epidemiological-clinical and prognosis aspects of deliveries assisted by instrumental extractions in a reference maternity unit in Dakar. **Materials and Methods:** This was a retrospective, descriptive and analytical study between January 1, 2017 and December 31, 2017, a period of 12 months at the maternity ward of the Nabil Choucair Health Center. The collection was carried out using the survey form completed on the basis of the analysis of the files, the delivery register and the anaesthesia register of the operating room. The parameters studied were about socio-demographic characteristics, indications and prognosis. The data entry was carried out using the Sphinx version 5 software and the data analysis using the Epi info version 3.5 software. **Results:** During the period of our study, we collected 94 instrumental extractions. The frequency of instrumental extractions was 1.7%. The average age of the patients was 25 years with extremes of 16 to 43 years old. The average parity was 1 with extremes 1 to 6. Among parturient women, 12 patients (12.8%) had a history of suction cup, two (2.1%) had received forceps and three (3.2%) had a cesarean section. The average gestational age was 39 Weeks of Amenorrhea (WA), the average uterine height was 32 cm, fetal heart sounds were normal in 98% parturient' cases. The vaginal touch had found a fully dilated cervix, a rupture of the amniotic sac with clear

amniotic fluid in 98% of parturient women and a fetus with an anterior left iliac occipito topin 69.4% of cases. The pelvis was clinically normal in all parturient women. The indications were dominated by maternal fatigue (65.9%). The spatula was the most commonly used instrument (82.7%). Episiotomy was performed in 97.3% of cases. The average weight of the newborn was 3058 grams and an Apgar score of 8/10 was noted in 96% of newborns. We noted 3 cases of maternal complications with perineal tear type (3.2%) and 1 case of perineal tear associated with postpartum hemorrhage (1.06%). The neonatal prognosis was dominated by 2 caput succedaneum cases (2.1%). Newborns were alive and well in 97.8%. We noted 2 cases of death, *i.e.* 2.1% in unsolved circumstances. All the mothers were alive and well at (100%). **Conclusion:** Instrumental extractions must be integrated into our structures to significantly reduce the number of abusive cesarean sections. The perfect mastery of extraction techniques and indications makes it possible to reduce fetal suffering while avoiding the morbidity associated with instrumental extractions.

Keywords

Instrumental Extraction, Suction Cup, Spoonbill, Forceps

1. Introduction

Childbirth is the set of mechanical, dynamic and plastic phenomena that result in the release of the newborn and its appendages from the maternal genital tract, from the twenty-second week of amenorrhea or a newborn weighing more than 500 g [1] [2]. Fetal expulsion can be assisted by instrumental extraction. The latter can be defined as the assistance at the birth of a child living by natural means or at the end of a caesarean section by means of an adapted instrument such as: the forceps, the suction cup or Thierry's spatulas. Instrumental extraction is performed to shorten the expulsive phase of the fetus out of the maternal genital tract [3]. A gradual decrease in instrumental extractions has been observed since the 1970s in obstetric practice [4] [5]. In Senegal, in a national survey, instrumental forceps extractions accounted for 11.2% of obstetric interventions in 1992, 8.6% in 1996 and 3.9% in 2001 [6]. They accounted for 0.09% in 1992, 0.05% in 1996 of births at the national level [6]. We conducted this study to analyze our practice in instrumental extraction. The objectives were to describe the epidemiological-clinical aspects and to evaluate the maternal and perinatal prognosis of our instrumental extraction's deliveries in a reference maternity clinic in Dakar.

2. Patients and Methods

Our study was carried out in the Maternity section of the Nabil Choucair Health Center located in the city of Dakar.

It was a retrospective, descriptive and analytical study carried out over the period from January 1, 2017 to December 31, 2017, *i.e*. a period of twelve months.

All women who gave birth by instrumental extraction during our study period were included in this study.

Incomplete files were secondarily excluded from the study.

For each parturient, the parameters studied were recorded on a survey sheet which collected socio-demographic characteristics, history, clinical examination, indications, neonatal parameters and maternal-fetal complications. The information was gathered through an examination of birth registers, notebooks for surgical reports and anesthesia records.

Data entry was carried out using Sphinx version 5 software and data analysis using Epi info version 3.5 software. All ethical measures have been taken for this study.

3. Results

3.1. Frequency

We collected 94 instrumental extractions out of 5342 deliveries from 1 January 2017 to 31 December 2017, *i.e*. an 12 month period in the Maternity Section of the Nabil Choucair Health Centre in Dakar, or a frequency of 1.7%.

3.2. Socio-Demographic Characteristics

The average age was 25.4 years with extremes of 16 and 43 years.

The average gestation status was 1.6 gestations at the extremes of 1 and 6 gestations.

The patients were mainly primigravida (69.9%) as reported in Table 1.

The average parity was 1.4 pares with extremes 1/6. More than 3/4 of the patients (80.9%) were primipares. For parity, primiparous women were in the majority (80.9%). Concerning marital status, the majority of our parturient women were married (97.8%).

3.3. Admission Procedures for Patients

In our series, 74.4% of patients came on their own and 24 (25.6%) were evacuated by other health structures.

Table 1. Distribution of patients by gestation (n = 94).

Gestation Status	Size	Percentage
Primigravida	65	69.9
Paucigests	12	12.9
Multigestes	10	10.8
Large multi-gestation	7	7.5
Total	**94**	**100**

3.4. Clinical Examination on Admission

In the history, 3 patients (3.2%) had received a cesarean section, 12 patients (12.8%) had received suction cups and 26 patients (27.7%) had a history of abortions. At prenatal follow-up, (96.8%) of the patients had 4 prenatal consultations and prenatal follow-up was regular. At admission, the general condition was good in the majority of parturient women (97.8%), the average age of pregnancy was 39 weeks of amenorrhea (WA) with extremes of 34 and 42 SA, the average uterine height was 32 cm with extremes of 28 and 40 cm. Fetal heart sounds were perceived in all patients. The vaginal touch found a fully dilated cervix with a cephalic presentation engaged in the lower part in all parturient women, an amniotic sac ruptured with clear amniotic fluid in 65.9% of them, a fetus with an anterior left iliac occipito top presentation in (63.8%) of cases. Episiotomy was performed in 97.3% of parturient women and the pelvis was clinically normal in all parturient women.

3.5. Technical

The spatula was the main extraction instrument used (82.7%) followed by the suction cup with (13.3%). Fetal extraction by spatula was most often done by direct occipito-pubic extraction in 70 parturients 70% followed by occipito-sacral extraction in 7 (7.4%) parturients. Fetal extraction by suction cup was found in 13 parturients (13.3%) (Table 2). The intake was respectively in occipito-pubic in 10 (10.6%) parturients and in occipito-sacral in 3 (3.19%) of them.

Table 2. Distribution by position variety (n = 94).

Variety of position	Size	Percentage
anterior left occipito-iliac	60	63.8
anterior right occipito-iliac	25	26.5
posterior right occipito-iliac	05	5.3
posterior left occipito-iliac	04	4.2
TOTAL	**94**	**100**

Table 3. Distribution of women according to indications (n = 94).

Indications	Size	Percentage
Maternal fatigue	62	65.9
Stop the progress	15	15.9
Fetal suffering	09	9.5
Scar uterus	04	4.2
Eclampsia	02	2.1
Prematurity	02	2.1
Total	**94**	**100**

3.6. Partogram

Partogram use was noted in more than 4/5 of patients (88%).

The indications were dominated by expulsion assistance for maternal fatigue in 65.9% of cases followed by stopping the progression of the fetal mobile in 15.9% and acute fetal suffering in 9.5%. All spatula (77) and forceps (4) applications were performed by physicians (Table 3). On the other hand, for the suction cup, 13 of them were performed by midwives (6.4%) and 7 by doctors (7.4%).

3.7. Neonatal Parameters

The average weight of the newborn was 3058 grams with extremes of 1100 and 4400 grams, an Apgar score equal to 8 in 96% of newborns. Fetal complications were noted in 4% or 3 cases and the types of complications were not mentioned in the data.

3.8. Prognostic Aspects

Maternals: We have not recorded any maternal deaths. We noted perineal traumas such as episiotomies (80.6%), perineal tears (4%) ranging from first degree to third degree without affecting the internal sphincter. Finally, a case of perineal tearing associated with postpartum hemorrhage has been reported.

Neonatals: Newborns were alive and well in 97.9% of cases. There were 2 cases of death or 2.12%. In our series were noted 2 cases (2.1%) of caput succedaneum.

4. Discussion

4.1. Socio-Epidemiological Characteristics

Since the 1970s, instrumental extractions have declined significantly worldwide. In our experience at the Nabil Choucair Health Center in Dakar, the average rate is 1.7%. Studies conducted in Senegal under the same socio-economic conditions have also shown a gradual decline over the years: 1.6% in 1996, 1.38% in 2008 [7] [8]. At the same time, the caesarean section rate has increased: 11% of deliveries in 2006, 15.5% in 2007 and 17.5% in 2008. We have already made the same observations [7] in a study conducted at the gynecological and obstetric clinic of Aristide Le Dantec Hospital between 1992 and 1996, with a rate of 1.6% of deliveries by forceps and an increase in the cesarean section rate from 12% of deliveries in 1992 to 17.5% in 1996. This low rate of instrumental extractions is also found in other African series [6] [9] [10] [11] [12]. There are several reasons that may explain this gradual decline in instrumental extractions use in our obstetrical practice:

- Extraction instruments are not always available in maternity wards;
- Midwives are less and less trained in these delivery techniques because of their rarity;
- The use of oxytocics is better codified in the treatment of rotation or expulsion defects related to dynamic dystocia;

- Caesarean section surgery has become a common intervention nowadays; its indications have expanded considerably, especially in the direction of the fetal interest.

At the national level, in a survey of emergency obstetric and neonatal care from 2012 to 2013, the cesarean section rate was 4.4% compared to 0.2% for instrumental extractions [13]. The epidemiological profile of women giving birth by instrumental extraction in Dakar is that of a young primiparous woman (average age 25 years), carrying a full-term pregnancy. This epidemiological profile is comparable to the series reported in other maternity hospitals in Senegal [6] [7], Côte d'Ivoire [11], Tunisia [12]. The epidemiological profile of patients who received instrumental extractions at the Nabil Choucair Health Centre in Dakar is that of a young primiparous woman (69.9%) whose average age was 25 years, most of these type of women were married (97.8%). This profile is similar to that found by Sow [14] in 2013, who reported 64.4% of primiparous women, with an average age of 25 years. This epidemiological profile has some particularities compared to those found in the European series. Indeed, Troyer [15] in Marseille reported an average age of 28 years and 80% of primipares. In developed countries, lack of awareness of pushing efforts due to lack of preparation for childbirth, maternal fatigue and systematic use of epidural anaesthesia during childbirth may partly explain the prevalence of primiparous women [16].

4.2. Clinical Aspects

In our series, the average age of pregnancy at the time of extraction was 39 weeks of amenorrhoea (WA) with extremes of 34 and 42. Other authors had found the same results [17] [18]. The history of cesarean sections had been found in 4 patients (4.3%). In 2015, Cissé had found the same frequency [19]. The prevention of uterine dehiscence is the main indication in the case of a scarred uterus. The pelvis was clinically normal in all parturient women with 100% of cases. Normal basins were also in the majority in Diouf's study with a frequency of 89.6% [8]. The partogram was used in the majority of cases (88%) in work supervision. According to the French national college of obstetricians and gynecologists, the systematic and correct use of the partogram is accompanied by a reduction in the number of forceps, but not the suction cup [12].

4.3. Indications, Operating Technique, Type of Instrument

In our series, the indications were mainly dominated by maternal fatigue in 65.9% and stopping the progression of fetal mobility in (15.9%) cases. The predominance of indications related to maternal fatigue is reported by several authors in instrumental extractions [6] [16]. In our study, the spatula was the most commonly used instrument with 82.7% of instrumental deliveries compared to 13.7% of suction cup and 4% of forceps. Diouf in Senegal had objected 50.9% of suction cup to 49.1% of forceps [8]. Our results are different from the data in the literature. This is explained by the fact that the spatula was the instrument

available during our study. Fetal extraction by spatula was most often done by direct occipito-pubic extraction in 70 (70%) parturients followed by occipito-sacral extraction in 7 (7.4%) parturients. Cissé in Senegal found (50.7%) in occipito-pubic position and (8.1%) occipito-sacral-position [7]. These 2 results are superimposable in terms of percentage but differ according to the type of instrument. In our series, the spatula was available during our study. Acute fetal suffering ranks third in our series of indications with a frequency of 9.5%; a relatively low frequency compared to the figures reported by the French national college of obstetricians and gynecologists [16] which considers that the anomaly of the fetal heart rate is the main indication for instrumental extractions mentioned in the literature. The difference in indications is explained by an early diagnosis of acute fetal suffering in developed countries promoted by labour monitoring methods such as recording fetal heart rate, fetal blood pH after scalp micropuncture. In our African context, we use clinical means such as auscultation of fetal heart sounds through Pinard's stethoscope and the appearance of amniotic fluid.

4.4. Prognostic aspects

Maternal Prognosis

In our study, episiotomy was performed in 97.3% of parturient women.

Authors such as Troyer [15] and Randram bliololona in Madagascar [20] also reported relatively comparable percentages with 96% and 79.25% respectively.

Our results are consistent with the data in the literature. Anglo-Saxon authors recommend episiotomy for almost all births in primiparous women; this seems excessive according to many French authors who argue that flexible perineas are possible in some primiparous women [21].

Maternal complications were dominated by 3 perineal tears (3.2%) and 1 case of perineal tear associated with postpartum hemorrhage (1.3%). We did not observe any cervical tears in our study. The prevalence in the literature of cervical tears is low after instrumental extraction, ranging from 0% to 3% [11] [22] [23]. One cohort study found an increased risk after a forceps (odds ratio of 2.2), but not after the suction cup [24]. These tears are related to a poor appreciation of expansion, the forceps or suction cup being applied to incomplete expansion as supported by Cissé [7]. With regard to postpartum hemorrhage, several cohort studies have shown a significant increase in hemorrhagic risk after instrumental extraction compared to the spontaneous lower route (Odds ratio ranging from 1.66 to 2.40) [25] [26].

The reasons given are the increased risk of soft tissue tears and uterine atony-promoted by the presence of associated factors such as dystocic labour, prolonged second phase and macrosomy. Two cohort studies, one Dutch with 3,434 [27] and one French with 19,182 [28], did not find that instrumental extraction was a significant risk factor for the severity of postpartum hemorrhage. In short, everything depends on the conditions of application and the perfect mastery of the

extraction technique by the midwife [29] [30].

Neonatal Prognosis

In our series, the majority of newborns had a good Apgar score (96%), a rate globally comparable to that noted in our cesarean deliveries as reported by Johnson in Thailand [31]. This observation, which is also found in the literature [7] [11] [32], shows that instrumental extraction does not increase the risk of neonatal suffering if the conditions of application are respected, if the indications are well established and if the technique is perfectly mastered. The neonatal mortality rate recorded in our series is 2 cases (0.4%) of live births. These results are comparable to those currently reported in the literature by Cissé and Ndiaye, which range from 0.3% to 0.5% live births [7] [8] [9]. It confirms the improvement in the neonatal prognosis of instrumental extractions. The neonatal lesion essentially found in our series was the caput succedaneum in 2 cases (2.1%), a minor lesion that is not specific to instrumental extractions [33].

5. Conclusion

Instrumental extractions are less and less practiced in our maternities. The indications of these maneuvers must be well posed and the conditions of achievements well respected to avoid failures and materno-fetal complications.

Limitations of the Study

This was a retrospective study and some files were not sufficiently informed.

Conflicts of Interest

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

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