

A term vaginal delivery by a patient with traumatic tetraplegia

A case report

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Abstract

Rationale: About 60,0000 people are involved in traffic accident each year in China and spinal cord injury (SCI) often occurs. Pregnant women with paraplegia is rare, and they face higher risk during pregnancy and childbirth.

Patient concerns: We report a case of a 35-year-old patient with SCI, who had vaginal forceps delivery at 38 weeks and 5 days of gestation.

Diagnoses: The patient was diagnosed with term pregnancy with traumatic tetraplegia.

Interventions: A vaginal forceps delivery was performed at 38 weeks and 5 days of gestation.

Outcomes: A vaginal forceps delivery of the patient was smooth. After delivery the patient recovered quickly, her vaginal blood was less, blood pressure was favoring.

Lessons: This study presents a case with traumatic tetraplegia during pregnancy. We suggest that regular prenatal care is necessary.

Abbreviations: AH = autonomic hyperreflexia, HR = heart rate, SCI = spinal cord injury, UTI = urinary tract infection.

Keywords: delivery, forceps delivery, spinal cord injury, traumatic tetraplegia

1. Introduction

With the wide spread personal ownership of automobiles, women suffering from spinal cord injury (SCI) due to traffic accident is increasing in China. Tan et al reported that the highest incidence is in the 20 to 29 years of age group.^[1] Most studies utilizing large databases have focused on specific injuries such as vascular trauma to the extremities and spinal cord injuries.^[2] In the United States, trauma is a leading cause of death and disability.^[3] As a result, there are an increasing number of pregnant women with SCI. Pregnancy in these patients present unique challenges to obstetric care providers. Paraplegic or tetraplegic conditions caused by SCI complicate pregnancy, and pregnant women with these conditions face higher risk during pregnancy and childbirth. In addition, many chronic medical

problems arise. These women are more prone to develop urinary tract infections (UTIs), constipation, anemia, and orthostatic hypotension.^[4]

We report a case of a 35-year-old woman with SCI, who had vaginal forceps delivery at 38 weeks and 5 days of gestation. The patient and her husband agreed to authorize us to share the figures and the experiences during the treatment procedure in our department. Informed consent was obtained. It was approved by the Suzhou University committee.

2. Case report

A 35-year-old woman, gravida 3 para 1 (1 previous vaginal birth 5 years ago), was referred to our Department of Obstetrics due to uterine contraction. At the time of admission, she was 38 weeks and 5 days pregnant with regular uterine contraction for 7 hours. At age 33, she was involved in a motor vehicle accident that resulted in a C3 vertebral column fracture. Since then, she had less sensory function and lost motor ability. Because of the economic condition, she did not undergo any rehabilitation program. Her family members took care of her daily life. She visited the hospital 1 time for prenatal care during pregnancy because of UTI at 37 weeks of gestation.

After admission, she was afebrile on examination, with a heart rate (HR) of 84HR and blood pressure of 128/76 mmHg. Physical examination revealed flaccid tetraplegia in both arms and legs. Her limbs power was grade 0/5. Her pain sensitivity was low. All her deep tendon reflexes were absent. Her plantar response was bilaterally mute. The rest of her physical examination was unremarkable. Obstetrical examinations were in the normal ranges: uterine height was 26 cm, abdomen circumference was 92 cm, fetal position was left occipitoanterior, fetal HR was 145/minute, the membrane was not broken, and

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cervical dilation was about 10 cm. Clinical testing was in normal ranges too and blood HB was 118 g/L. The patient was sent to the delivery room immediately. Because her abdominal pressure was weak, the patient underwent forceps delivery with local anesthesia and episiotomy. A 3400-g healthy male infant was born with Apgar scores of 9 and 9 at 1 and 5 minutes, respectively. Three obstetricians, 1 midwife, and 1 neonatologist were involved in the whole process. Blood loss in 24 hours was 460 mL after birth. She left the hospital in good condition on the 9th day after delivery.

3. Discussion

The global incidence of SCI, both traumatic and nontraumatic, is between 40 and 80 cases/million.^[5] Trauma is the leading cause of SCI and most of the cases are caused by traffic accidents. The most common mechanism of trauma was motor vehicle collisions (73%), followed by falls (14%) and automobile-pedestrian collisions (13%).^[6] Our patient was involved in a motor vehicle accident that resulted in a C3 vertebral column fracture. Paraplegia caused by traffic accident has a huge impact on the reproductive system of woman which includes lack of sex desire, dysmenorrhea, increasing abortion, and preterm labor.^[7] Besides the risk of preterm birth, the patients with SCI have more risk of infection and Caesarean section.^[8] Sexual function and to a lesser extent reproduction are often disrupted in women with SCI.^[5,9] Our patient had a history of amenorrhea for 6 months and an irregular menses for 6 months.

After 1 year, she began to have regular menses cycles. Two years later, she was pregnant during which she had several UTI. Moreover, patients with SCI always have constipation and pressure sores because of lack of movement. A survey showed that 72% health professionals had insufficient knowledge of SCI. Most of them had encountered difficulties in taking care of women with SCI. Because caring for the pregnant trauma patient requires a systematic and multidisciplinary approach.^[10] Our patient did not have these problems due to high-fiber diet and painstaking care by family members. Pregnant paraplegic women can also have impairment of pulmonary function, especially in patients with high thoracic or cervical spine lesions usually above the T5 level. Some authors recommend baseline and serial pulmonary function tests to assess vital capacity and possible need for ventilator assistance in labor.^[11]

Autonomic hyperreflexia (AH) was considered as the leading cause for a high rate of Caesarean section at rates of 18% to 49% reported for women with SCI, although it is unclear whether the predominant indications are obstetric.^[12] Our patient had a history of C3 level fracture, but underwent vaginal delivery without any symptoms of AH. Therefore, AH is not the indication for Caesarean section. Since painful stimulation can cause AH, anesthesia during labor is suggested to all patients with spinal injury level at or above T6, mainly by means of an epidural catheter, which was maintained for 24 to 48 hours to prevent autonomic dysreflexia.^[13] If unrecognized, AH can cause devastating complications during pregnancy such as intracranial hemorrhage, hypertensive encephalopathy, and death.^[14] Bi-level positive airway pressure may reduce episodes of dizziness and autonomic dysreflexia.^[15]

As a precaution, the patient is advised to admit to hospital 1 to 2 weeks before delivery. This patient came to our hospital at 37 weeks of gestation and was suggested to be admitted, but she refused because of economic concern.

The obstetricians take account of maternal condition, productivity, pelvic condition, and fetal size when choosing the method of delivery. The productivity power of labor is divided into 2 types: uterine contractions and auxiliary contractions. Productivity power is given priority to uterine contraction. Sympathetic stimulation promotes uterine contractions and accelerates delivery. The function of sympathetic nerve center is damaged after SCI, causing weakness of uterine contraction. The auxiliary power of labor is provided by the contractions of abdominal muscles and pelvic floor muscles. In patients with paraplegia, especially when the plane of SCI is in the thoracic segment, assisted labor is significantly weakened or even lost. Our patient was multipara, whose uterine contractive force was strong, while the auxiliary contractile force was weak. Episiotomy and forceps delivery has always been recommended because of prolonged 2nd stage of labor. Our patient underwent episiotomy and forceps delivery. Although breastfeeding was recommended for mothers with SCI, our patient had a short period of breastfeeding. In addition, she expressed the difficulty in taking care of her baby.

4. Conclusion

Pregnancy in women with SCI is relatively safe. But complications can be aggravated during pregnancy and perinatal period. Caesarean section is not the indication for women with SCI. Caring for the pregnant trauma patient requires a systematic and multidisciplinary approach. A multidisciplinary team consisting of anesthetist, neurological physician, obstetrician, and neonatologist are important in deciding the optimal delivery method.

Author contributions

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References

- [1] Tan H, Sloan J, Barlow I. Improvement in initial survival of spinal injuries: a 10-year audit. *Injury* 2005;36:941–5.
- [2] Jain N, Ayers G, Peterson E, et al. Traumatic spinal cord injury in the United States, 1993–2012. *JAMA* 2015;313:2236–43.
- [3] DiMaggio C, Ayoung-Chee P, Shinseki M, et al. Traumatic injury in the United States: in-patient epidemiology 2000–2011. *Injury* 2016;47:1393–403.
- [4] Bertschy S, Pannek J, Meyer T. Delivering care under uncertainty: Swiss providers' experiences in caring for women with spinal cord injury during pregnancy and childbirth – an expert interview study. *BMC Pregnancy Childbirth* 2016;16:181.
- [5] Castro JS, Lourenco C, Carrilho M. Successful pregnancy in a woman with paraplegia. *BMJ Case Rep* 2014;2014.
- [6] Petrone P, Marini C. Trauma in pregnant patients. *Curr Probl Surg* 2015;52:330–51.
- [7] Ghidini A, Healey A, Andreani M, et al. Pregnancy and women with spinal cord injuries. *Acta Obstet Gynecol Scand* 2008;87:1006–10.
- [8] Sterling L, Keunen J, Wigdor E, et al. Pregnancy outcomes in women with spinal cord lesions. *J Obstet Gynaecol Can* 2013;35:39–43.
- [9] Courtois F, Alexander M, McLain A. Women's sexual health and reproductive function after SCI. *Top Spinal Cord Inj Rehabil* 2017;23:20–30.
- [10] Lucia A, Dantoni S. Trauma management of the pregnant patient. *Crit Care Clin* 2016;32:109–17.
- [11] ACOG Committee Opinion: Number 275, September 2002. Obstetric management of patients with spinal cord injuries. *Obstet Gynecol* 2002;100:625–7.

- [12] Darney B, Biel F, Quigley B, et al. Primary cesarean delivery patterns among women with physical, sensory, or intellectual disabilities. *Womens Health Issues* 2017;27:336–44.
- [13] Le Liepvre H, Dinh A, Idiard-Chamois B, et al. Pregnancy in spinal cord-injured women, a cohort study of 37 pregnancies in 25 women. *Spinal Cord* 2017;55:167–71.
- [14] Kuczowski K. Labor analgesia for the parturient with spinal cord injury: what does an obstetrician need to know? *Arch Gynecol Obstet* 2006;274:108–12.
- [15] Brown J, Bauman K, Kurili A, et al. Positive airway pressure therapy for sleep-disordered breathing confers short-term benefits to patients with spinal cord injury despite widely ranging patterns of use. *Spinal Cord* 2018; doi: 10.1038/s41393-018-0077-z.