

## Labour dystocia: Vesical calculus can be the cause

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Obstructed labour is a well-known clinical entity in maternity units, cephalopelvic disproportion being the most common cause. Here, we report a rare case of obstructed labour resulting from a large vesical calculus. The patient was a referred case from a district hospital for delayed progress of labour. The diagnosis of large vesical calculus causing labour obstruction was made by doing a vaginal examination. On vaginal examination, a large calculus of apparent size  $\sim 7\text{ cm} \times 6\text{ cm}$  was palpated behind the anterior vaginal wall, which was preventing the descent of the head of the fetus. An emergency caesarean section was performed with simultaneous removal of vesical calculus by cystotomy. The postoperative period was uneventful.

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Obstructed labour is a well-known clinical entity, and cephalopelvic disproportion is the most common cause. However, a large vesical calculus causing labour obstruction is extremely rare.<sup>[1]</sup> Very few cases of large vesical calculus causing labour obstruction have been reported in the literature. During pregnancy, a bladder calculus may cause infection, abortion, premature delivery, urinary fistula and rarely labour dystocia<sup>[2]</sup> and uterine rupture. Sometimes, a vesical calculus may remain asymptomatic, and may attain a large size of several centimetres. In such cases, it may be diagnosed for the first time during labour, causing labour obstruction where timely intervention is necessary to prevent vesicovaginal fistula<sup>[2]</sup> or uterine rupture. Thus, timely diagnosis and intervention can prevent maternal and fetal morbidity and mortality.

### Case report

A 25-year-old female was referred from a district hospital for delayed progress of labour (14 hours), with an estimated gestation of 9 months, no significant antenatal history, a history of dysuria and incontinence of urine for 2 years and haematuria for the previous 2 months. The patient was unbooked, and had not had an ultrasound in this pregnancy. She had had labour pains, and so she attended the district hospital. After observation for 12 hours, the staff referred her to the Government Medical College and Hospital, Rewa, Madhya Pradesh, India, as a primigravida at term with obstructed labour, with the cervix 4 cm dilated, fetal station at  $-3$ . The patient reached the central unit approximately 2 hours after the referral. On examination, she had good uterine contractions, a cephalic presentation, the fetal heart rate was 128/min, the cervical dilatation was 4 cm, the membranes were absent, a 34-week uterine size, good uterine contractions and Bandl's ring present. A hard mass of size approximately  $7\text{ cm} \times 6\text{ cm}$  was palpated in the anterior vaginal wall, which was preventing the descent of the head of the fetus. Catheterisation of the bladder proved difficult, and no urine was obtained. The patient was immediately booked for caesarean section with an indication of obstructed labour due to a large vesical calculus. Surgeons were requested in theatre for the management

of the vesical calculus. Caesarean section was performed under spinal anaesthesia. A female baby of 2.2 kg was delivered. The baby had a low Apgar score, and was transferred to the neonatal intensive care unit. A large calculus of size approximately  $9\text{ cm} \times 9\text{ cm} \times 5\text{ cm}$ , larger than originally estimated, was palpated in the bladder. Cystotomy was performed, and a calculus weighing 205 g was removed (Fig. 1). The bladder was closed in two layers with Vicryl 2-0. A urine volume of 500 mL was drained soon after the removal of the stone. The Foley urinary catheter was kept in for 21 days, and then removed. The patient had a wound dehiscence that was resutured, and she was ultimately discharged. The patient returned for follow-up after 15 days. There were no complaints, and no abnormalities were detected. Analysis of the stone showed a struvite stone with ammonium magnesium phosphate crystals, with degraded epithelial cells and leukocytes. Struvite is the most common mineral found in urinary tract stones in humans, and can also occur in domesticated animals. The formation of the

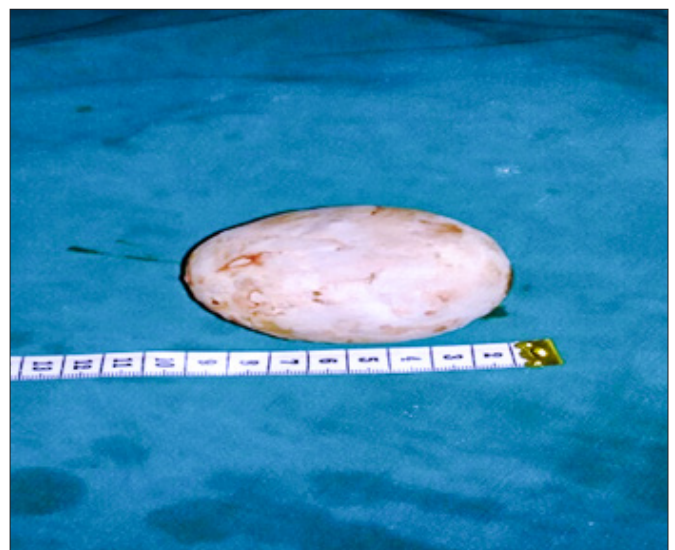


Fig. 1. Vesical calculus,  $9\text{ cm} \times 9\text{ cm} \times 5\text{ cm}$ , weighing 205 g.

stones is potentiated by bacterial infection that hydrolyses urea to ammonium, and raises the urine pH to neutral or alkaline.

## Discussion

Vesical calculus may be found in women with urinary stasis due to outlet obstruction, resulting in a significant post-void residual urine. It is also found in healthy women.<sup>[3]</sup> Alkaline urine caused by urea-splitting organisms (*Proteus*, *Klebsiella*, *Serratia* and *Enterobacter*) is responsible for struvite stones (ammonium magnesium phosphate stones).<sup>[2]</sup> Renal calculi may descend into the urinary bladder and attain a larger size owing to deposition of phosphates.<sup>[3,4]</sup> Vesical calculus is usually associated with irritating symptoms such as dysuria, incontinence, urinary urgency and frequency and lower abdominal pain. However, if a vesical calculus does not obstruct the urinary bladder inflow, outflow or present as a recurrent infection, it may remain asymptomatic, and may attain a large size. The symptoms usually found due to vesical calculus are often overlooked in pregnancy because the distinction between clinical features of normal physiology and pathology during pregnancy is often unclear.<sup>[5]</sup> The common complications of vesical calculus during pregnancy are infection, abortion and premature delivery, and rarely, a large calculus can cause labour dystocia, urinary fistula and very rarely, uterine rupture. Vesical calculus is diagnosed by X-ray and intravenous pyelogram, which are not commonly performed during pregnancy.<sup>[6]</sup> Ultrasonography during pregnancy may be diagnostic, but a vesical calculus may be missed in the second half of pregnancy owing to the interference of the fetal head.<sup>[6]</sup> A large vesical stone may be palpable on vaginal examination, as in our case. The management of a large vesical calculus in pregnancy depends on the gestational age. If it is symptomatic and diagnosed during the antenatal period, then cystolithotomy is preferred,<sup>[1,7]</sup> whereby, caesarean section may be avoided. If a calculus is neglected, then it can trap between the symphysis pubis and the fetal head, causing arrest of fetal descent and labour dystocia.<sup>[2,8,9]</sup> Rarely, the calculus dislodges and moves in front of the fetal head, and subsequent pressure on the fetal head by each uterine contraction may cause prolapse of the calculus along with the anterior vaginal wall, causing pressure damage to the urinary bladder wall.<sup>[10]</sup> If the calculus is detected at this stage, then caesarean section with cystolithotomy may be associated with postoperative haematuria and vesicovaginal fistula.<sup>[6]</sup> If labour is further prolonged, the calculus may be expelled by rupture of the urinary bladder and vaginal wall.<sup>[10]</sup>

## Conclusion

Vesical calculus is a rare cause of dystocia. The diagnosis is typically made by the patient's history, clinical examination and routine antenatal ultrasonography, preferably in the first trimester. The mode of delivery can be planned according to the size of the calculus and gestational age. Complications can be prevented by timely diagnosis and proper management. If a large vesical calculus is diagnosed during the antenatal period, then cystolithotomy should be performed and caesarean delivery can be avoided, but the indications are the same as for the non-pregnant state. If a large vesical calculus is diagnosed during labour, then a caesarean section with cystolithotomy should be performed to minimise urinary bladder damage and the chances of fistula formation. Awareness of the condition may assist in considering the possibility of a calculus. Ultrasonography in the first and second trimester may confirm the diagnosis. A routine consideration of structures outside the uterus may lead to the diagnosis, as in some cases a vesical calculus may remain asymptomatic.

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