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(CASE REPORT)

# Retracted Dilapan-s in a multiparous woman at term on induction of labour

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## Abstract

The use of Dilapan-S as an agent of induction of labour has recently gained a lot of attention for its efficiency, safety profile and lack of foetal complications. However, one of its known complications is the retraction of the rods into the uterus. Fortunately, the incidence is very rare, but the mechanisms remain elusive and poorly understood. This paper is about a multiparous woman at 39 weeks with unfavourable cervix and a multiparous os who was admitted for IOL using Dilapan-S. During the digital insertion of the 5th rod, she spontaneously ruptured her membranes with retraction of four of the rods into the uterus. Soon after, she developed uterine contractions and was transferred into the delivery suite with an improved Bishop score and a cervical dilatation of 3 cm. An augmentation of labour was commenced with oxytocin but was later discontinued due to a suspicious CTG trace. She had an emergency caesarean section for maternal request with the delivery of a healthy baby and retrieval of the four Dilapan-S rods intra-operative.

**Keywords:** Dilapan-S; Retraction; Induction; Labour

## 1. Introduction

Dilapan-S is a hygroscopic rod made of a patented Aquacryl® hydrogel rod commonly used as a mechanical method of induction of labour[1,2]. Typically, 3 to 5 rods are inserted in a single procedure into the cervix, where they expand uniformly (from 4mm to 15mm) over a 12-to-24-hour period using fluid absorbed from the surrounding cervical tissue, hence causing cervical effacement and dilatation[2].

Unlike hormonal methods of induction, the use of DIlapan-S has not been shown to cause any foetal complications[3]. However, known complications of its use include, bleeding, mild discomfort, falling out of the cervix and the vagina, spontaneous rupture of membrane, cervical tear, breaking of the rod during retrieval, sticking of the rod to the vagina or the cervix and rarely, retraction into the uterus[4]. Retracted Dilapan-S is very rare[5].

Below is a case which attempts to look at the potential cause and mechanism of retraction of dilapan rods in a woman having an induction of labour on our maternity ward.

## 2. Case report

A 35-year-old, multiparous woman with a booking BMI of 27 and 2 previous spontaneous vaginal deliveries was admitted for induction of labour at 39 weeks. The antenatal care was consultant led and her serial growth scans from 32 weeks showed a growth curve on the 90th centile. An ultrasound scan done at 38 weeks confirmed a cephalic presenting foetus. At admission, the foetal presentation was cephalic and her CTG was normal and appropriate for her gestational age. Her vaginal examination revealed a multiparous os with a Bishop's score of 3. The Dilapan-S rods were inserted digitally into the cervix.

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On insertion of the fifth osmotic dilator, there was a spontaneous rupture of membranes followed by drainage of liquor and retrieval of 1 of the osmotic dilators. The other 4 rods could not be retrieved following digital and speculum examination. The foetal presentation remained cephalic. Soon after, she developed uterine contractions and complained of labour pains. She was re-examined and noted to be 3 cm dilated with a bishop score of 7. She was transferred to the delivery suite where she subsequently had augmentation of labour with oxytocin for slow labour progress. While in labour, she developed a suspicious CTG trace, and the oxytocin infusion was discontinued. At this point, she was examined and noted to be 7 cm dilated. While on conservative management for the CTG changes, she requested for an emergency caesarean section which she subsequently had.

At the caesarean section, two Dilapan-S rods were spontaneously expelled with the birth of the baby's shoulder and the other two were retrieved manually from the uterine fundus. The rest of the surgery was uncomplicated, and she was discharged home two days later with a healthy baby.

## 3. Discussion

Dilapan-S is a mechanical agent of induction of labour which acts by absorbing fluid from the adjacent cervical tissues, expanding uniformly in the process while causing uniform dilatation of the cervix, via a radial pressure.[1,2,4,6]. This mechanical stretch leads to the release of endogenous prostaglandins, which initiates collagen degradation, cervical softening and ripening[2,4].

It is an effective means of induction of labour with a very good safety profile and no known associated foetal complications due to its unlikely chance of causing uterine hyperstimulation[2,4,5]. Many large studies have found no cases of uterine tachysystole related to Dilapan-S use during cervical ripening and it is increasingly been used as an agent for outpatient induction of labour.[3] However, known complications may include device entrapment and/or fragmentation, expulsion, patient discomfort or bleeding, spontaneous rupture of membranes, spontaneous onset of labour and cervical laceration. Retraction of dilapan is however rare.

Very few cases of osmotic cervical dilators have been reported and relates to the previous version of DIlapan[5]. In two of such cases reported in the literature, both were related to cervical ripening for termination of pregnancy[7,8]. In both cases, the rods were located by abdominal ultrasound scan, but while spontaneous expulsion occurred in one case, removal of the rods via hysteroscopy was required in the other case.[7,8.]

The above lady is a multiparous lady, with a starting Bishop score of 3. She had digital insertion of the Dilapan S rods, by personnel trained in its insertion after a vaginal examination to confirm her Bishop score. Although, the insertion of Dilapan-S was initially described via the use of a forceps into the cervix during a speculum examination by the manufacturer, digital insertion of Dilapan-S rod is a well acceptable and increasingly common means of inserting DIlapan-S rods[2]. This is because digital insertion, especially in multiparous women like in the above case, may be easier and more comfortable for the patient. There is no indication in this case, to suggest that the digital insertion facilitated the spontaneous rupture of membrane, as the initial examination confirmed an unfavourable cervix and excluded the presence of bulging membranes.

The occurrence, mechanism and cause of retracted Dilapan-S is not well elucidated. In the above lady, it seems the retraction was due to a sudden transfer of the rods into the uterus as the woman spontaneously ruptured her membrane suggesting a rapid dilatation of the cervix at the same time. This is not impossible in multiparous women who may undergo a quick labour progress as suggested by the onset of labour pains, significant change in Bishop score and a cervical dilation of 3 cm following a vaginal examination done, soon after the spontaneous rupture of membrane. It is therefore possible that a rapid dilatation of the cervix resulted in an iatrogenic insertion into the uterus. This was not the mechanism of retraction in some of the other cases of retracted hygroscopic dilators documented in the literature.

As advised by the instruction manual, which suggests that the rods should be retrieved immediately when there is a spontaneous rupture of membrane, an immediate attempt was made to retrieve the rods but only one out of the five rods could be found in the vagina at the initial examination suggesting a diagnosis of retracted Dilapan-S rods which were later retrieved during the emergency caesarean section.

Although, there was no indication that the retracted Dilapan-S rods contributed clinically to the decision for an emergency caesarean section in this lady, it is however not impossible that the psychological impact of the retracted Dilapan-S rods could have contributed to the woman's request for an emergency caesarean section when she was informed of the suspicious CTG changes in labour, which at that point was being managed conservatively. Interestingly, two of the Dilapan-S rods were expelled at the delivery of the shoulder and the other two were found in the uterine

fundus after the delivery of the foetus and the placenta. This demonstrates how dynamic the motion of a retracted Dilapan rod could be within the uterus once retracted.

Although this case was managed surgically at delivery, the confirmation of a suspected retracted Dilapan-S is done via an abdominal ultrasound examination[7,8]. However, care must be taken not to confuse the hypoechogenic nature of the Dilapan-S rods with the amniotic fluid when the woman is yet to deliver. It is therefore important that adequate training is required to improve the identification and diagnosis of retracted rods using ultrasound scan in women still in labour. This is also important as it is easy to assume that retracted rods have fallen out in women whose rods are incomplete during their retrieval. Removal of the retracted rods can be done incidentally during an emergency caesarean section as in this woman or under hysteroscopy guidance[7]. A report of spontaneous expulsion remote from the time of insertion has also been documented[8].

Due to its rarity, there are currently no National guideline available for the management of this complication. Units adopting the regular use of Dilapan-S for induction of labour must therefore create local guidelines for the management of this complication as there is a chance that more cases with variable presentation will be seen as the use of Dilapan-S becomes more popular due to its favourable safety profile.

## 4. Conclusion

Trained personnel must be aware that retracted Dilapan-S rods, although rare, is a possible complication of the use of Dilapan-S for induction of labour. They must inform women of this risk before inserting the rods and discuss the necessary investigations and management with them. Units that provide induction of labour with Dilapan-S rods must keep a record log of this complication and create a written guideline for its investigation and management. More cases need to be reported in other to understand the risk factors and mechanism of occurrence of this rare complication.

## Compliance with ethical standards

### *Disclosure of conflict of interest*

The authors declare no conflict of interest.

### *Statement of informed consent*

Informed consent was obtained from all individual participants included in the study.

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