

## SURGICAL MANAGEMENT OF PERFORATED HYMEN WITH TRAUMA-INDUCED ABORTION IN A CROSSBRED HEIFER

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### ABSTRACT

*A 5-months pregnant crossbred heifer was presented to the Obstetrics Unit with the history of butting with another cow 24 hours earlier. On clinical examination, the animal was found to have a perforated hymen. Surgical intervention was performed using scissors to extend the perforation in the hymen, and patency was ensured. Upon further exploration, an immature fetus with detached cotyledons, likely due to trauma was detected and the fetus was delivered by gentle traction. The heifer was treated with antibiotics along with anti-inflammatory drugs for 3 days, resulting in uneventful recovery. This case highlights the importance of prompt diagnosis of a microperforated hymen prior to performing artificial insemination at the field level.*

**Keywords:** Crossbred heifer, persistent hymen, abortion

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### INTRODUCTION

The hymen, a transverse ridge located at the junction of the vagina and vestibule, is well defined in the ewe and mare but poorly defined in the cow and sow (Kumar, *et al.*, 2016). During embryonic development, the hymen undergoes

canalization to establish continuity between the vaginal lumen and the vestibule. Failure of this canalization process results in a persistent (imperforate) hymen. Persistent hymen in heifers is a congenital abnormality of the female reproductive tract in which the hymenal membrane separates the vagina and vestibule (Parkinson *et al.*, 2001). Normally, the hymen undergoes complete canalization and rupture; failure of this process may result in persistent hymen and associated infertility in some heifers. In microperforate hymen the thin tissue at the vaginal opening covers almost the entire opening, but has a very small hole in the center (Sofi *et al.*,

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2023). Congenital perforated hymen is rare in cattle and buffalo heifers (Singh *et al*, 2010).

Perforated hymen in a heifer may occur due to several causes. It can be congenital, where the hymenal membrane develops abnormally during fetal life and is already perforated at birth. Hormonal influences, especially increased estrogen during growth, may weaken the membrane and lead to spontaneous rupture. Mechanical trauma, such as mounting by other animals, injury, or rough handling, can also tear the hymen. In some cases, infections or inflammation of the vagina (vaginitis) may damage the membrane and cause perforation. Accidental breeding or forced copulation may rupture the hymen as well. Additionally, iatrogenic causes, such as improper vaginal examination or insertion of instruments during veterinary procedures, may lead to perforation of persistent hymen (Parkinson *et al.*, 2001).

The diagnosis of perforated hymen in a heifer is mainly made by clinical and vaginal examination. The condition is usually suspected in heifers presented with infertility or difficulty during mating or artificial insemination. On examination of the external genitalia, mild mucous discharge may sometimes be observed in the vagina. On per vaginal or speculum examination, a thin hymenal membrane with a small opening is observed partially obstructing the vaginal passage (Satheskumar *et al.*, 2020). In certain cases, accumulation of mucus behind the membrane may also be detected (Kumar *et al.*, 2017). Ultrasonographic examination may further assist in confirming

the presence of fluid in the vagina. The present communication briefly describes perforated hymen coupled with abortion and its management in a crossbred heifer

## CASE HISTORY AND OBSERVATION

A 5 months pregnant crossbred heifer was presented to Veterinary Clinical Complex, Veterinary College and Research Institute, Orathanadu with a history of accidental trauma after butting with another cow 24 hours earlier. On general examination, the heifer appeared normal and active, mucous membrane was pink and moist with the rectal temperature of 38.6°C. Vaginal examination of the animal revealed that the vaginal mucous membrane was pink and moist with edematous vulva. On further exploration using vaginal speculum a thick band like structure located in the middle of vaginal canal and two small opening on either side of band, anterior to the external urethral orifice (Fig.1) was observed. Based on the clinical and speculum examination the case was confirmed as a perforated hymen.

## TREATMENT AND DISCUSSION

Under epidural anaesthesia using 2 per cent Lignocaine hydrochloride, surgical intervention in the form of hymenectomy was performed. The surgical procedure to excise the obstructive hymen as described by Satheskumar *et al.* (2022) was followed with slight modifications. Briefly the animal was properly restrained and the perineal region was cleaned using antiseptic solution. A vaginal speculum was inserted to dilate the vaginal canal and to visualize

the hymenal membrane clearly. Using a sterile surgical scissors, the hymenal membrane was carefully incised along the midline to enlarge the opening between the vagina and vestibule, and no bleeding was noticed during the procedure (Fig.2). Further exploration after hymenectomy, a relaxed cervix with fetus lodging in the reproductive passage was observed which, indicated a progressing abortion (Fig.3). With adequate lubrication, a fetus of approximately four months gestational age was delivered vaginam (Fig.4). The animal was administered with inj. streptopenicillin @ 22,000 IU/kg body weight I/M, inj. chlorpheniramine maleate @0.5mg /kg body weight I/M and inj. flunixin meglumine @ 1.1mg/kg body weight I/M for 3 days resulting in uneventful recovery.

In perforated hymen, the membrane fails to rupture completely, resulting in a partial opening or small perforation in the hymenal membrane due to incomplete canalization of the vaginal plate at the junction of the urogenital sinus and Mullerian ducts. Because of this defect, the hymen remains as a persistent membrane with a small opening (Roberts, 1971). Persistent hymen might appear as vaginal constriction which may occur anterior to the urethral opening, presenting as a partition with a central aperture or as a complete septum between the vulva and the vagina (Parkinson *et al.*, 2001). In cases of complete imperforation of the hymen, secretions accumulate, leading to distension of the anterior vagina and uterus and resulting in persistent discomfort in the affected cow (Hafez and Hafez, 2000; Satheshkumar *et al.*, 2020).

Genetic or hereditary factors may also play a role in some animals, leading to congenital malformations of the reproductive tract. If the condition is due to an autosomal recessive gene, the defective gene is located on one of the autosomes (non-sex chromosomes) and the abnormal trait appears only when two copies of the mutant gene are present. A heifer must inherit the defective allele from both the sire and the dam to express the abnormality. Animals with only one copy of the gene are carriers and usually appear normal but can transmit the defect to their offspring (Roberts 1971). Complete obstruction of the hymen results in accumulation of vaginal secretions due to prevention of the normal outflow of uterine secretions, which progressively increases with age and cyclic ovarian activity of the animal (Troiano and McCarthy, 2004). Such conditions have been frequently reported in crossbred heifers (Madhusudan *et al.*, 2016; Kumar *et al.*, 2017) and Murrah buffaloes (Singh *et al.*, 2010), where foul-smelling pus-like or mucus-like fluid was evacuated through the vagina (Kumar *et al.*, 2017).

In the present case, abortion of the fetus was observed, possibly resulting from trauma incurred during fighting. Such trauma can cause hemorrhage, inflammation, and irritation of the reproductive tract, leading to uterine contractions and disruption of placental attachment and blood supply, ultimately resulting in fetal expulsion (abortion); furthermore, traumatic injury may predispose the uterus to secondary infection, further increasing the risk of fetal loss (Parkinson *et al.*, 2001). However the fetus was lodged in birth canal due to persistent hymen.

Cases of imperforate hymen and their surgical correction have been previously documented in crossbred heifers (Satheskumar *et al.*, 2020), purebred heifers (Kumar *et al.*, 2020), and buffalo heifers (Singh *et al.*, 2010) and also successful correction of persistent hymen was achieved previously by elaborate surgical procedure (Kim *et al.*, 2012) or by using simple trocar puncturing along with digital pressure (Kumar *et al.*, 2016). After surgical intervention, recurrence or adhesions can be prevented by vaginal douching with potassium permanganate and boroglycerine lotion (Singh and Singh, 1999). In the present case, intravaginal douching with 0.5% potassium permanganate solution was performed, and an emollient containing cetrimide and povidone cream was applied to prevent adhesion and ensure patency.

In conclusion, careful vaginal examination, particularly during estrus when heifers are presented for artificial insemination is essential for the early

detection of conditions such as persistent or imperforate hymen in animals with unexplained breeding problems or abortion. Early diagnosis and timely intervention can facilitate successful conception and help prevent subsequent complications, including obstruction to normal fetal expulsion. Early diagnosis and timely surgical correction can effectively restore patency of the reproductive tract. Although the condition is considered congenital and a definite hereditary pattern has not been clearly established, affected animals are generally advised to be excluded from breeding as a precaution.

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**Fig.1.** Two slit-like openings in the birth canal



**Fig.2.** Persistent hymen in the form of band

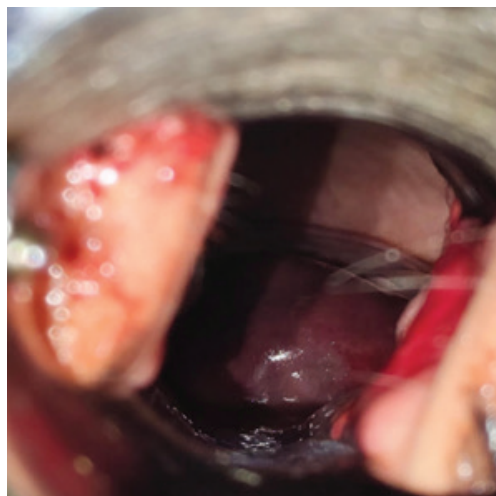


Fig.3. Fetus lodged in birth canal

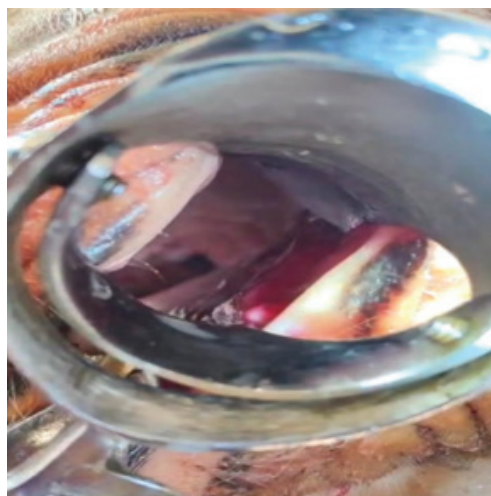


Fig.4. Patency of birth canal after surgery

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