

## Scientific Report

# Congenital persistent urachus, urethral obstruction and uroperitoneum in a calf

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## Summary

Persistent patent urachus with other accompanying anomalies like urethral obstruction and uroperitoneum quickly deteriorates animal conditions which necessitate prompt surgical intervention and animal salvage. A 10-day-old calf was referred to clinic with mildly distended abdomen, history of umbilical dribbling and no signs of normal urination since birth. On clinical laboratory results and ancillary tests persistent patent urachus complicated with imperforated urethra and uroabdomen was diagnosed. After abdominocentesis under ultrasonography, exploratory laparotomy was performed. Persistent urachus was removed and attempts failed to insert a catheter into urethra. Then, a Foley catheter was placed into bladder and passed through subcutaneous tissues and exited lateral to the umbilical region from skin. The calf voided via the catheter right after standing up and showed clinical improvement for the two months after-discharge follow up.

**Key words:** Uroabdomen, Urachitis, Omphalitis, Patent urachus

## Introduction

Persistent patent urachus occurs most frequently in foals and has less prevalence in calves (Jennings, 1984; Potter, 2007). As in foals, omphalitis often accompanies patent urachus and is believed to be involved in its pathogenesis. In calves, the spread of the infection to intra-abdominal umbilical remnants is commonly seen (Baird, 2008). Treatment of patent urachus usually consists of topical intra-urachal application of cauterizing agents or surgical correction of the umbilical remnants if complicated by the spread of the infection to intra-abdominal structures (Braun *et al.*, 2009; Grover and Godden, 2011). This disorder is sometimes accompanied by other congenital anomalies, as it was accompanied by urethral obstruction and consequently uroperitoneum in the present case, deteriorated animal condition and could be life threatening if not dealt with properly.

## Case history

A 10-day-old female Holstein calf was referred to clinic. No sign of normal urination since birth was the owner's major complaint. Blood samples were obtained for haematological analysis. Serum creatinine concentration was 2.1 mg/dl upon admission. Serum creatinine concentration was 1.9 mg/dl after fluid therapy. Ultrasonography showed a large accumulation of anechoic fluid in the abdominal cavity. The urinary bladder was filled with urine and its margin was seen normal. Further investigation revealed patent urachus (Fig. 1). Prior to surgery, further haematological assessment was performed to see if there was any sepsis. An ultrasound guided abdominocentesis was performed under aseptic condition. Creatinine concentration of the aspirated liquid was 22 mg/dl. Then, several attempts were made in order to insert a proper catheter from vaginal urethral opening toward the bladder, which

was not successful.



**Fig. 1: Sagittal ultrasound image of caudal abdomen using 3-5 MHz convex probe. Note patent urachus (PU) attached in cranioventral portion of urinary bladder (UB). Cranial is to the left and top is ventral**

A diagnosis of patent urachus complicated by uroperitoneum and/or urethral obstruction was made and animal was prepared for abdominal surgery. Once abdominal cavity was opened, 4 to 6 L of clear yellow fluid spewed out. Internal urachus was separated from abdominal wall and double ligated as close as possible to the bladder and removed and sent to pathology lab. A polyethylene urine catheter was passed through the incision site of the bladder antegrade, from the bladder into the urethra. These attempts were repeated several times with different catheter sizes, but were unsuccessful. A decision was made to make a cutaneous urinary diversion in order to save the animal. To place a No. 16 Foley catheter a small incision was made in the skin in paramedian area a few centimeters cranial to the fusiform incision. The tip of the catheter was inserted into the skin hole and directed caudally into the subcutaneous area and inserted into the abdominal cavity through a separate stab incision in paramedian area of the same side (right side) of abdominal wall. Then, the catheter was inserted into bladder lumen through the former incision. The catheter was also secured in subcutaneous tissue by placing a Roman sandal suture pattern. The fusiform incision was sutured in layers. The end of the catheter was then secured to skin.

The calf began voiding urine immediately after standing up. The calf continued to show evidence of clinical

improvement. Communication with the client for two months after discharge indicated that no complications had been encountered and the calf was healthy and active and urinates via catheter.

## Discussion

Usually, the infection of the urachal remnants, umbilicus and bladder occur secondary to the patent urachus as a result of an ascending infection (Mendoza *et al.*, 2010). In the present case, several attempts to open the urethra were unsuccessful from both the bladder or vagina. This shows that this was not just caused by a simple diaphragm or membrane. Later, histopathological evaluation confirmed the specimen to be urachus. The peritoneal fluid to serum creatinine concentration showed high ratio, indicating urine accumulation in abdominal cavity. There was no evidence of bladder rupture during surgery, and urine probably entered the abdomen from a weakened area of the internal urachal remnant when bladder pressure was high, and the opening sealed intermittently with fibrin after the pressure was relieved. Others reported similar problems which were caused by membranous diaphragm occluding the external urethral meatus (Hylton and Trent, 1987). In those cases, it was possible to incise the obstruction sharply.

If the patency of urethra is in question, antegrade and retrograde urethral catheterization can be performed as a diagnostic aid for calves. Recognition and correction of an imperforate urethra is essential if surgical correction of the patent urachus is undertaken. If opening the urethra is impossible, a way to exit urine from the bladder should be created to save the animal.

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