

# Urethral fistula after resection of a penile fibropapilloma in a Holstein Friesian bull

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## Abstract

A 2-year-old Holstein Friesian bull with a penile tumour was referred to the University of Veterinary Medicine Hannover, Foundation, Germany, where the tumour was resected and diagnosed as a fibropapilloma. A urethral fistula was diagnosed eight days postoperatively and was present nine months later, although the bull had normal copulation behaviour and satisfactory fertility. Surgical removal of fibropapillomas in close proximity to the urethra is an effective treatment. A urethral fistula, which may occur as a postsurgical complication, did not have an adverse effect on copulation capacity and fertility of the bull.

**Key words:** Fistula, penis, urethra

## Harnröhrenfistel nach Resektion eines Penisfibropapilloms bei einem Holstein Friesian Bullen

Ein 2-jähriger Holstein Friesian Bulle wurde aufgrund einer Umfangsvermehrung am Penis in die Tierärztliche Hochschule Hannover, Deutschland, eingeliefert. Die Umfangsvermehrung wurde chirurgisch reseziert und pathohistologisch ein Fibropapillom diagnostiziert. Acht Tage post operationem war eine Harnröhrenfistel sichtbar, die auch neun Monate später noch persistierte. Der Bulle zeigte zu diesem Zeitpunkt einen ungestörten Deckakt und eine befriedigende Fruchtbarkeit. Die chirurgische Resektion von Fibropapillomen, die in unmittelbarer Nähe der Harnröhre liegen, scheint eine wirksame Behandlung zu sein um die Fruchtbarkeit solcher Tiere zu erhalten. Die Harnröhrenfistel, die als postoperative Komplikation aufgetreten war, hatte keinen negativen Einfluss auf die Deckfähigkeit und die Fruchtbarkeit des Bullen.

**Schlüsselwörter:** Fistel, Penis, Urethra

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## Case report

Fibropapilloma is the most common neoplasm of the penis in bulls and is caused by infection with bovine papillomavirus type I<sup>10,11</sup>. Cows in the same herd as an infected bull often have similar lesions on the vulva and teats<sup>1,11</sup>. Fibropapillomas are most common in young bulls up to three years of age<sup>9</sup> and are usually located at the glans penis. Their attachment to the penile mucosa may be broad-based or pendulous<sup>1,7</sup>.

Spontaneous resolution of fibropapillomas may occur but is slow, and thus surgical removal is a better option in bulls that are intended for breeding<sup>6</sup>. When left untreated, the tumour may adversely affect the fertility potential of the bull. Pain or mechanical interference during copulation may hinder intromission and render the bull reluctant to breed<sup>7</sup>. A large tumour may cause

phimosis, paraphimosis or penile prolapse<sup>1,11</sup>, and fibropapillomas with an ulcerated surface may be a source of contaminants, such as microorganisms and blood, which interfere with cryopreservation of collected semen. Rupture or erosion of the urethra in the area of the tumour is a severe complication that may lead to periurethral phlegmon<sup>10</sup>.

This case report describes the treatment and outcome of a young bull that developed a urethral fistula after surgical resection of a penile fibropapilloma.

A 2-year-old Holstein Friesian bull was referred to the Clinic for Cattle, University of Veterinary Medicine Hannover, Foundation, Germany, because of a penile neoplasm. The bull originated from a herd of 110 pluriparous Holstein Friesian cows housed in a freestall barn. The owner reported that the bull had been able to

This work is dedicated to Prof. Karl Nuss 60<sup>th</sup> birthday

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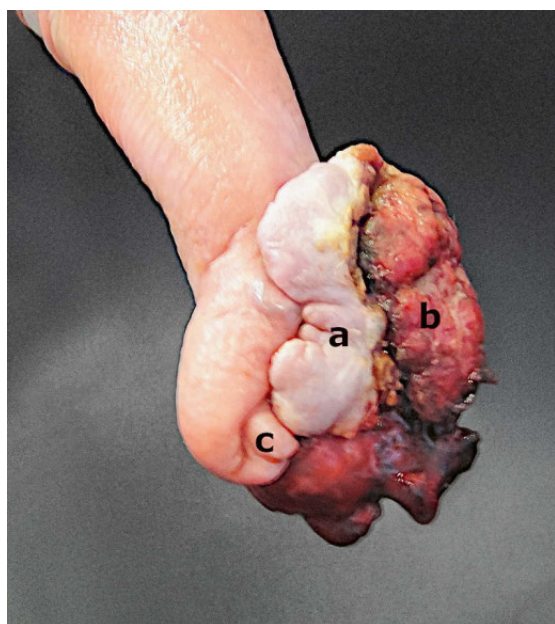
mount and breed cows, but the pregnancy rate of the herd was not satisfactory.

Clinical examination of the bull revealed penile prolapse and a 7×5×2 cm mass in the region of the glans penis. The mass had a broad-based attachment to the penile mucosa and its surface was covered with irregular, fissured and partly necrotic granulation tissue (Fig. 1). Gentle palpation of the mass caused diffuse oozing of blood. The demeanour and appetite of the bull were normal.

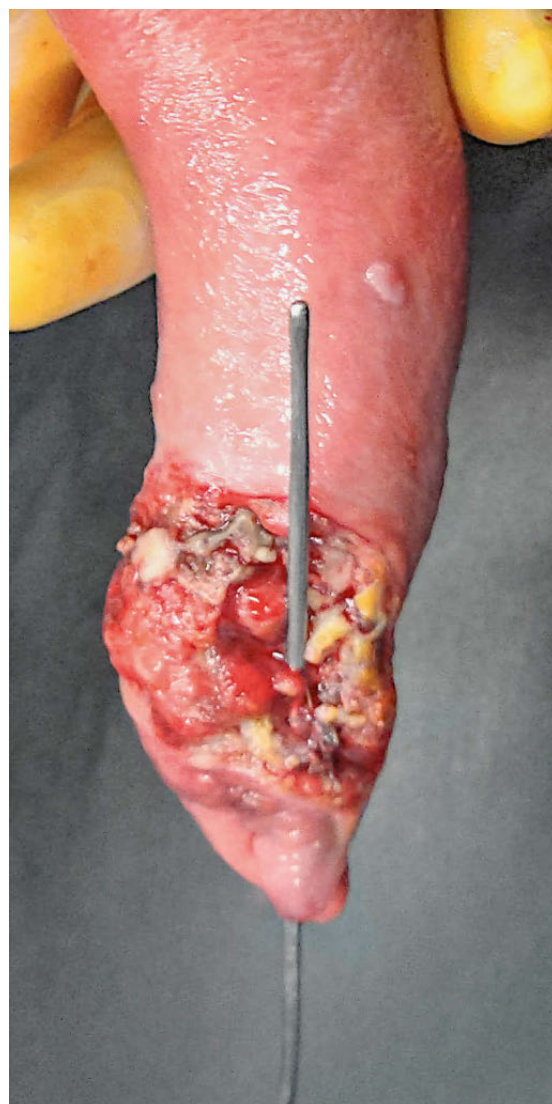
Caudal epidural anaesthesia using 0.1 mg/kg xylazine hydrochloride (Rompun® 2%, Bayer Vital GmbH, Leverkusen, Germany) in 20 ml of sterile water (B. Braun Melsungen AG, Melsungen, Germany) was carried out, and the bull was placed and restrained in lateral recumbency on a hydraulic tilt table (Werner GmbH, Höhenkirchen, Siegertsbrunn, Germany). Due to the extent of the surgical field and the close proximity to the urethra systemic antibiotic treatment was started consisting of sulfamidine trimethoprim (24 mg/kg, intravenously; Riketron®, aniMedica GmbH, Senden-Bösensell, Germany) given once-daily for three days. Meloxicam (0.5 mg/kg, intravenously; Melosolute®, CP-Pharma Handelsgesellschaft mbH, Burgdorf, Germany) was administered preoperatively and on the next day. Local anaesthesia of the penile mucosa was achieved by submucosal application of 20 ml lidocaine hydrochloride (Ursocain® 5%, Serumwerk Bernburg AG, Bernburg, Germany). A metal probe was introduced approximate-

ly 5 cm into the urethra to define its limits and to prevent iatrogenic trauma to the urethra during surgery. After aseptic preparation resection of the mass was attempted using electrocautery (Erbotom F2, Erbe Elektromedizin GmbH, Tübingen, Germany) with a scalpel blade shaped tip (width 0.4 mm) but was only partially successful because of the close proximity of the tumour to the urethra. The wound was covered with chlortetracycline hydrochloride spray (Animedazon®, aniMedica GmbH, Senden-Bösensell, Germany), and the bull was released from the tilt table and walked to the barn. Diffuse haemorrhage from the mass occurred during surgery but ceased spontaneously after about one hour.

Histological examination revealed an ulcerated, poorly demarcated and moderately cellular exophytic mass.



**Figure 1:** Penile fibropapilloma with epithelialised (a) and irregular, fissured and necrotic granulation tissue (b) in a 2-year-old Holstein Friesian bull (urethral process; c).



**Figure 2:** Glans penis of a 2-year-old Holstein Friesian bull 8 days after resection of a penile fibropapilloma. Healthy granulation tissue is visible at the periphery in some parts of the wound and a metal probe introduced into the urethra points to a urethral perforation at the centre of the wound.

Neoplastic cells were arranged in strands and bundles and supported by a small amount of fibrovascular stroma. There were numerous spindle-shaped cells, most of which were characterised by indistinct borders, a moderate amount of fibrillar eosinophilic cytoplasm and an eccentric spindle-shaped nucleus with moderate amounts of heterochromatin and up to one basophilic nucleolus. Neoplastic cells had mild to moderate anisokaryosis and anisocytosis and up to one mitotic figure per high-power field (Fig. 4). Based on all the findings, a diagnosis of fibropapilloma was made.

Three days after surgery the wound was 2×3 cm and coated with fibrinonecrotic material, and eight days after surgery, the wound was partly surrounded by a seam of healthy granulation tissue. A stainless steel probe introduced into the tip of the urethra revealed a urethral perforation in the middle of the wound (Fig. 2). The wound was cleaned, loose necrotic tissue was removed and covered with chlortetracycline hydrochloride spray. Eight days after surgery the bull was discharged from the clinic with the recommendation of sexual rest for two weeks. Twelve weeks after surgery, the wound had healed but there was a 2×1 cm urethral fistula (Fig. 3). Mild mechanical irritation of the mucosal surface did not cause bleeding. An attempt at semen collection for semen analysis failed because the bull did not accept the artificial vagina and electroejaculation was not permitted by the owner.

Telephone follow-up interviews of the owner were conducted six and nine months after surgery and revealed that the urethral fistula was still present and that there was no evidence of bleeding or recurrence of the papilloma. The bull was able to copulate normally and the pregnancy rate of the herd had returned to satisfactory.

Good pain management is essential for resection of a penile fibropapilloma in a bull. After bilateral anaesthesia of the pudendal nerves, which was not done in the present case, the penis remains sensitive to manipulation<sup>10</sup>. High-volume caudal epidural anaesthesia may cause ataxia or recumbency of the patient because of nonselective blockade of sensory and motor nerve fibres. Epidural injection of xylazine, an alpha2-adrenergic agonist, results in selective blockade of sensory nerve fibres and a considerably lower depression of motor function than local anaesthetics<sup>2,3</sup>. However, epidural administration of xylazine has a delayed onset of analgesic action compared with local anaesthetics<sup>2</sup>. In the present report, epidural administration of xylazine combined with lidocaine applied submucosally provided adequate anaesthesia of the penile region and allowed the bull to stand and walk immediately after surgery.

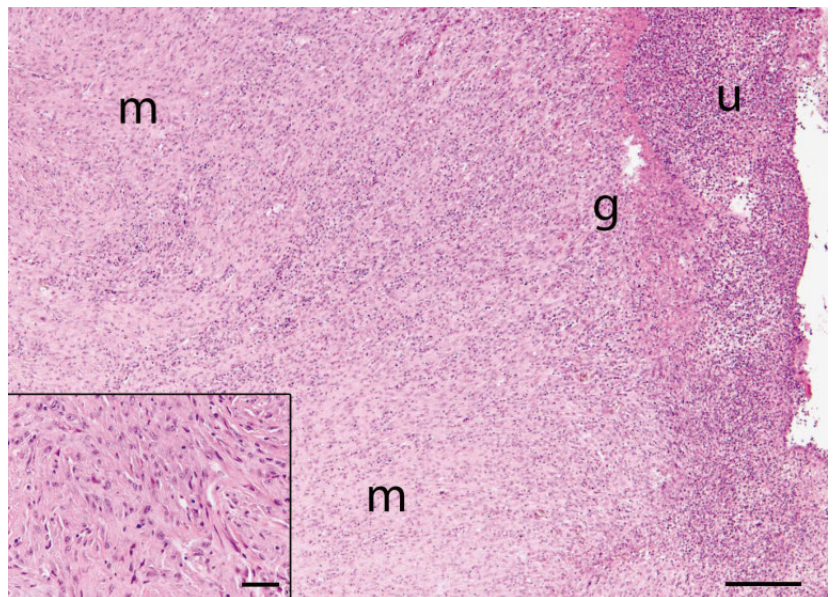
Electrocautery a possible technique for resection of a broad-based penile fibropapilloma because these tumours have a propensity to bleed when disturbed<sup>1,11</sup>. However, as exemplified in the present case, haemorrhage is usually not serious and tends to resolve spontaneously within a few hours<sup>9</sup>. Another option for resection of penile fibropapilloma are cryosurgery and laser

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**Figure 3:** Glans penis of a 2-year-old Holstein Friesian bull 12 weeks after resection of a penile fibropapilloma. Wound healing is complete, and a metal probe introduced into the urethra points to a large urethral fistula.



**Figure 4:** Section of a penile fibropapilloma stained with haematoxylin and eosin in a 2-year-old Holstein Friesian bull. Spindle-shaped tumour cells with mild anisokaryosis and anisocytosis (m, inset) are arranged in strands and bundles. The surface area is ulcerated (u) and there is suppurative inflammation and granulation tissue (g). Bar = 200 µm, inset = 20 µm.

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therapy but the cost of the equipment may be a limiting factor in their application<sup>4,8</sup>. When perforation of the urethra occurs inadvertently during surgery, suturing of the wound is not recommended because it has been associated with abscess formation, haemorrhage and subsequent haemospermia, which may be more detrimental than development of a urethral fistula<sup>9</sup>. In the present case, urethral perforation did not occur during surgery but instead developed during the healing process and was first noticed at the follow-up examination eight days later. At this point in time, surgical correction of the defect was deemed impractical because of necrotic changes of the wound area and no treatment was instituted. The fistula was not associated with any untoward clinical signs, and firm manipulation of the affected mucosa did not cause bleeding. Semen analysis was not possible because the bull did not accept the artificial vagina, and thus haemospermia could not be ruled out.

Penile fibropapillomas have a postoperative recurrence rate of 10 to 32%<sup>1,5</sup>. In the present case the tumour did not recur within the first 12 weeks after surgery even

though the fibropapilloma was only partially resected. This was in agreement with the notion that surgical excision of the bulk of a fibropapilloma is sufficient for successful surgical correction and that complete excision is not necessary<sup>1</sup>.

Histological examination of the resected tissue showed proliferation of moderately to well differentiated mesenchymal cells and a layer of epithelium with widespread ulceration. The occurrence of spindle tumor cells and the characteristic location of the mass led to the diagnosis of fibropapilloma. Ulceration is a typical feature of these tumors, particularly when they are large<sup>7</sup>.

In conclusion, resection of a fibropapilloma in close proximity to the urethra is a worthwhile treatment option in bulls. The risks of this procedure included the formation of a urethral fistula. However, this did not appear to have an adverse effect on the copulation capacity and fertility of the bull.

### Fistule uréthrale après résection d'un fibropapillome pénien chez un taureau Holstein Frisian

Un taureau Holstein Frisian de 2 ans atteint d'une tumeur du pénis a été référé à l'Université de médecine vétérinaire de Hanovre, Fondation, en Allemagne, où la tumeur a été résectuée et diagnostiquée comme un fibropapillome. Une fistule uréthrale a été diagnostiquée huit jours après l'opération et était présente neuf mois plus tard, bien que le taureau ait eu un comportement de copulation normal et une fertilité satisfaisante. L'ablation chirurgicale des fibropapillomes à proximité immédiate de l'urètre constitue un traitement efficace. Une fistule uréthrale, qui peut survenir comme complication post-chirurgicale, n'a pas eu d'effet négatif sur la capacité de copulation et la fertilité du taureau.

**Mots clés:** Fistule, pénis, urètre

### Fistola uretrale dopo resezione di un fibropapilloma penieno in un toro frisona Holstein.

Un toro frisona Holstein di 2 anni con un tumore al pene è stato inviato all'Università di Medicina Veterinaria di Hannover, Germania, dove il tumore è stato chirurgicamente resecato e diagnosticato come fibropapilloma. Una fistola uretrale è stata diagnosticata otto giorni dopo l'intervento chirurgico ed era presente ancora nove mesi dopo, anche se il toro aveva un comportamento di popolazione normale e una fertilità soddisfacente dopo l'operazione. La rimozione chirurgica dei fibropapillomi in prossimità dell'uretra è un trattamento efficace per mantenere la fertilità. La fistola uretrale, che può presentarsi come complicanza post-chirurgica, non ha avuto alcun effetto negativo sulla capacità di popolazione e sulla fertilità del toro.

**Parole chiave:** fistole, pene, uretra

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