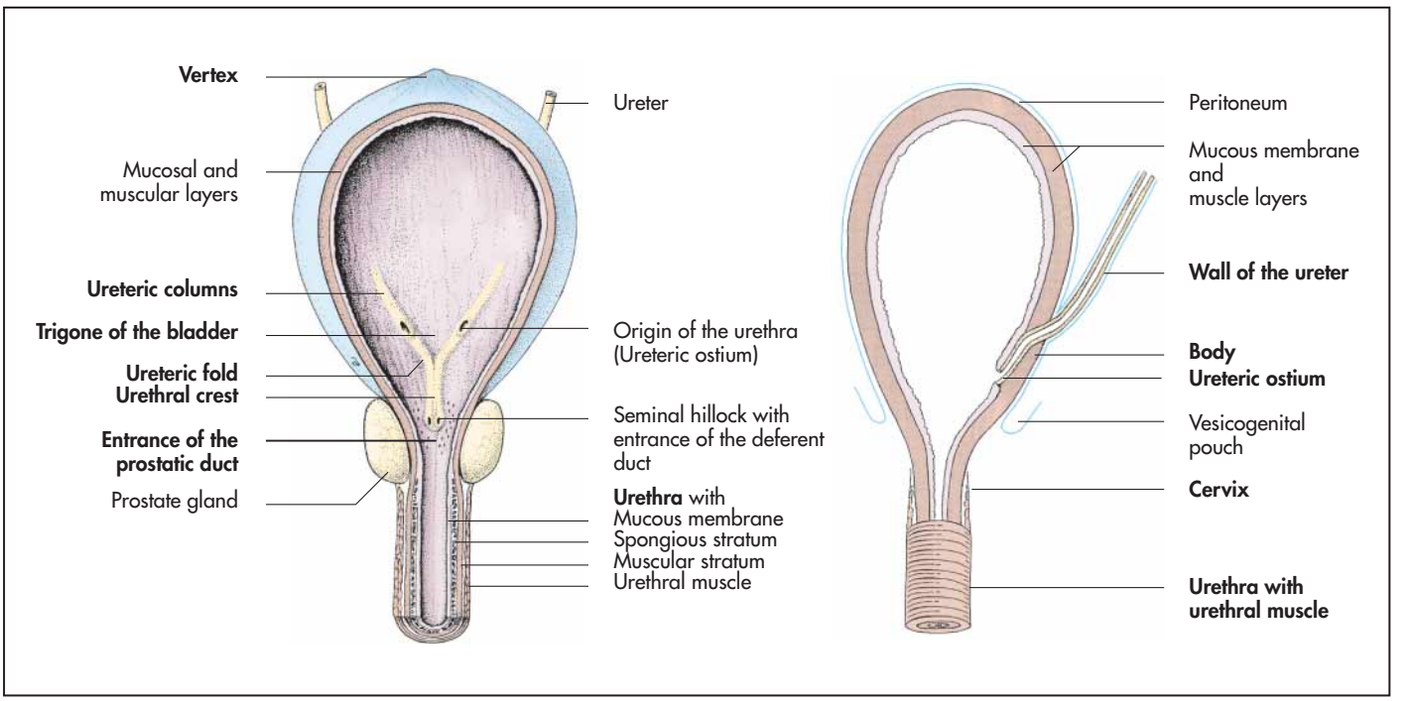

Fig. 9-19. Interior of the urinary bladder of the dog, ventral aspect (left), ureterovesical junction (right) (schematic).

hypothesised. Recent research has shown that continence depends upon the tension passively exerted by the elastic elements within the mucosa and on the action of the striated urethra muscle (Fig. 9-19).

The bladder is lined by a **transitional epithelium**. The mucosa of the bladder is irregularly folded when the bladder is empty. These folds disappear during distension, with the exception of two **folds** (plicae uretericae), which extend from the ureteral opening to the neck of the bladder, where they unite to form the **urethral crest** which is continuous with the urethra. The **triangular area** bounded by these folds is termed the trigone of the bladder (trigonum vesicae) and is thought to have an enhanced sensitivity (Fig. 9-19).

The bladder receives its main **blood supply** from the **caudal vesical arteries**, which are branches of the vaginal or prostatic arteries. It is supplemented cranially by the reduced umbilical arteries.

The **lymphatics** of the bladder drain into the **iliosacral lymph nodes**. The urinary bladder receives **sympathetic** and **parasympathetic innervation**. Sympathetic fibres arise from the **hypogastric nerves**, which radiate from the caudal mesenteric ganglion into the **pelvic plexus**. Parasympathetic pelvic nerves are derived from the **pudendal nerve**, the ventral branch of the third sacral segment, and radiate in to the **pelvic plexus**. Parasympathetic fibres supply somatic innervation to the bladder muscle; sensory nerves are also routed through the pudendal nerve.

The bladder can be tapp in the dog and the cat just cranial to the rim of the pelvis. The needle should be advanced in a caudodorsal direction to avoid injuries when the bladder contracts.

Urethra (urethra)

In the **female animal** the urethra exclusively serves to convey urine, while in the male animal it carries urine, semen and seminal secretions. The female urethra extends caudally on the pelvic floor ventral to the reproductive tract. It passes obliquely through the wall of the vagina and opens with the **external urethral opening** (ostium urethrae externum) ventrally at the junction between vagina and vestibule. The length and diameter of the urethra varies considerably between the domestic mammals. It is short and wide in the horse and comparatively long in the dog, where it opens on a small elevation flanked by two grooves. In the cow and sow the urethralis muscle encloses the suburethral diverticulum, which opens together with the urethra into the vagina. This arrangement can cause difficulties during catheterisation. The structure of the female urethra is continuous with that of the bladder.

The **male urethra** extends from an internal opening at the bladder neck to an external opening at the end of the penis. It is divisible into a:

- **pelvic part** (pars pelvina) with:
  - preprostatic portion (pars praeprostatica),
  - prostatic portion (pars prostatica) and
- **penile part** (pars penina).

The **pelvic part** of the urethra begins at the internal opening at the bladder neck. Its **preprostatic portion** extends from the internal opening to the **seminal hillock** (colliculus seminalis), an oval enlargement of the urethral crest, which protrudes into the lumen of the urethra. It is flanked by the slit-like openings of the deferent ducts.

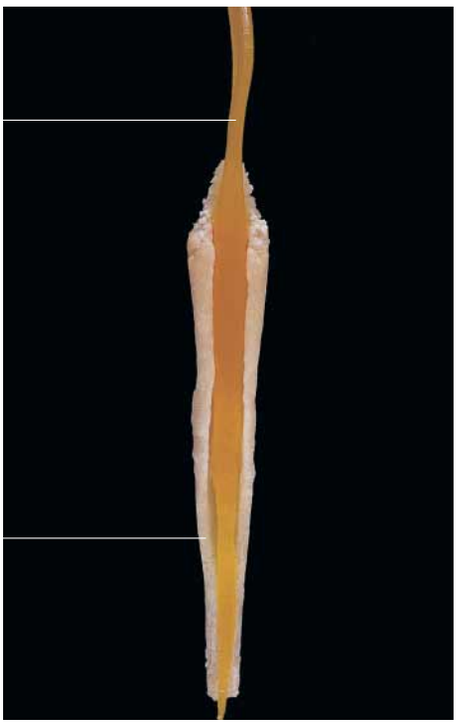

Fig. 9-20. Urethra of a dog within the penis with the penile bone (ventral aspect, corrosion cast).

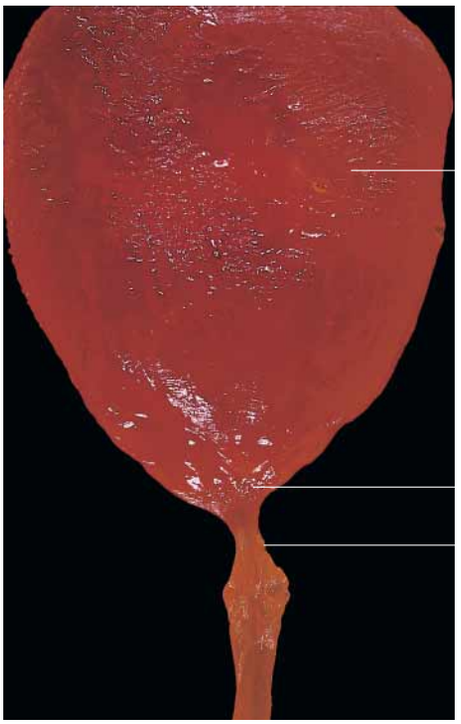

Fig. 9-21. Urinary bladder and origin of the urethra (corrosion cast).

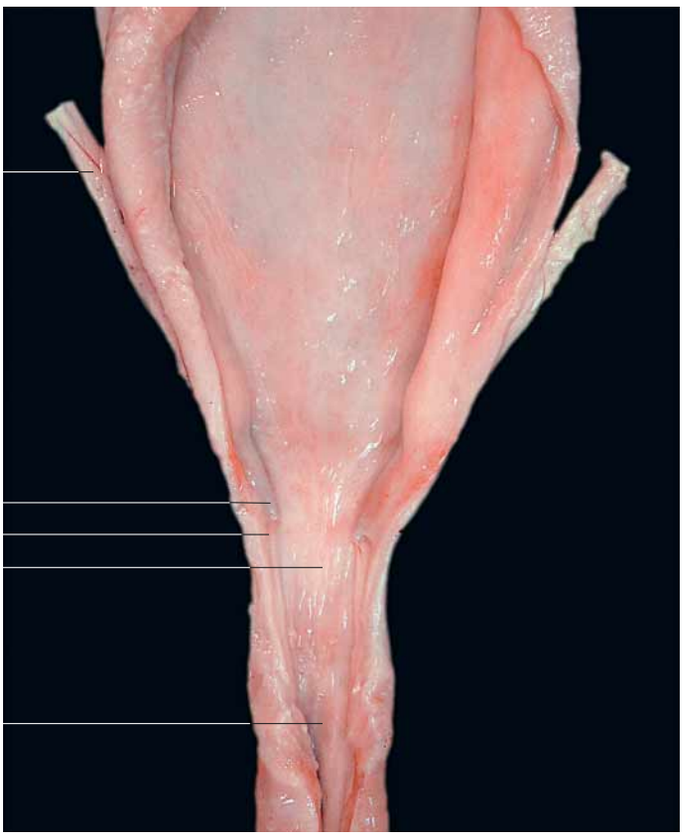

Fig. 9-22. Urinary bladder of an ox (interior aspect); preparation Prof. Dr. W. Pérez, Uruguay.

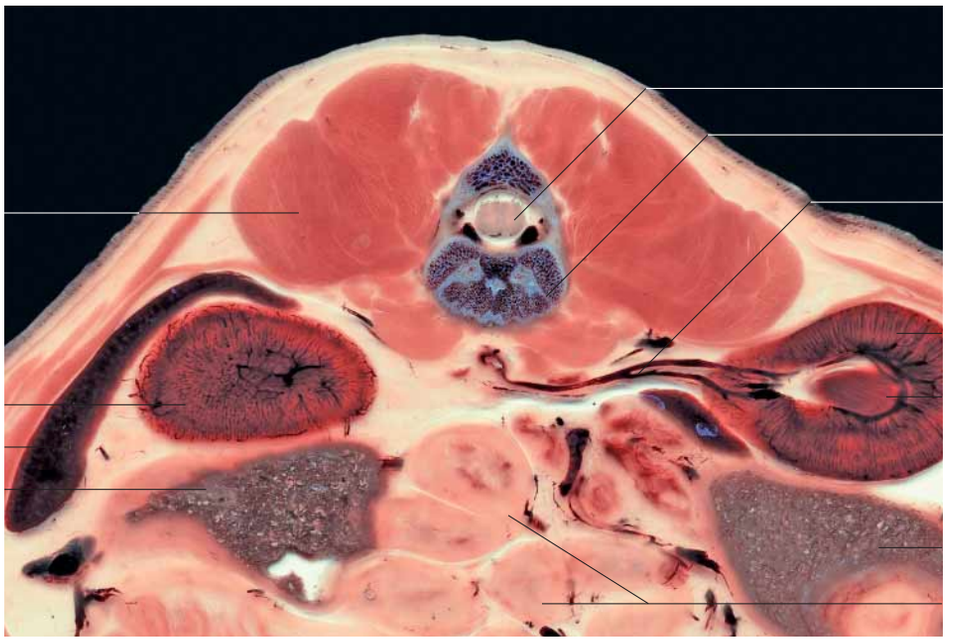

Fig. 9-23. Transverse section of the abdomen at the level of the kidney of a dog (caudal aspect).

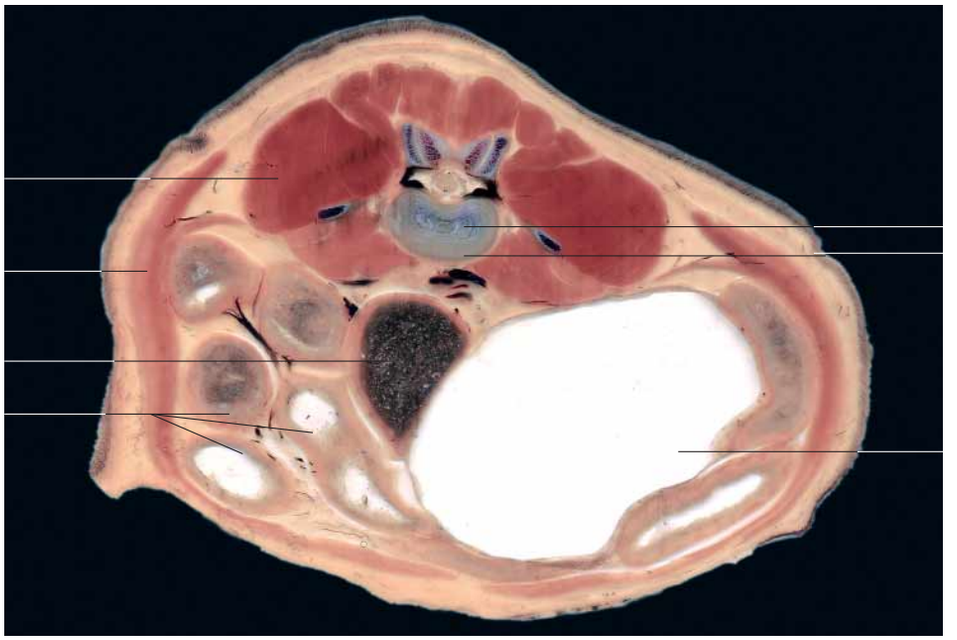

Fig. 9-24. Transverse section of the abdomen at the level of the urinary bladder of a dog (caudal aspect).

The **prostatic portion** is joined by the **deferent** and **vesicular ducts** and passes through the **prostate gland**.

The **penile portion** of the urethra begins at the ischial arch and is described with the penis in the following chapter.

The **urethral wall** contains a **venous plexus** in its submucosa, which has erectile properties that aid continence. The urethra is surrounded by the **striated urethral muscle** over most of its length. Caudally the muscle fibres are present on the ventral and lateral surface. Contraction of these muscle bundles closes the external opening of the urethra. Voluntary control of the urethral muscle is provided by somatic fibres of the **pudendal nerve** which also contains **sympathetic** and **parasympathetic fibres**.

Clinical terms related to the urinary system: nephritis, pyelonephritis, pyelography, cystoscopy, urography, urolithiasis, urethritis, urethrography, urethrostomy, urethrocystography.