Histological Study of the Accessory Genital Glands at Small Ruminants' Males in Sheep (*Ovis aris*) and Goats (*Caprus hircus)*

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Abstract

The study showed that the seminal vesicle in ram and buck posses folded mucous membrane. Its type classified as a simple columnar epithelium with basal cells in between which characterized by spherical tends to ovoid nuclei. The gland was classified as tubuloalveolar gland and sometime compound tubular gland according to the section of the gland. The capsule of the gland formed from loose connective tissue (collagen and smooth muscle fibers) giving positive reaction with masson's trichromestain.

The bulbourethral gland have secretory units in different shapes and sizes. In histological section appeared alveolar, saccular or tubular shape, for this reason the gland classified as tubuloalveolar gland. The capsule of bulbourethral gland composed of dense connective tissue involves collagen, elastic, smooth muscle and striated muscle fibers. The capsule send septi which invaded in between the secretary units and continuous with lamina properia of submucosa and dividing the gland to tubules. The prostate gland is disseminated type in ram and buck generally (no body of gland). The glandular tissue part distributed around the pelvic urethra embedded in the wall of pelvic urethra. The prostate gland distinguished histologically as a tubuloalveolar type. These alveoli lining by simple columnar epithelium, the histological section showing the lining epithelium of the prostate gland duct changed to pseudostratified columnar epithelium. The histological results revealed the myoepithelial cells surrounding the alveoli of prostate gland. The gland secretion is seromucoid secretion which give positive reaction with PAS stain. The histological section the glandular part of vas deference ampullae classified as branched tubular lumen due to many folds of lining epithelium projected inside the tubular lumen of glandular tissue of ampullae. The section of the glands showed narrow and wide tubules lining simple columnar epithelium and pseudostratified columnar epithelium characterized by rounded nuclei.

It was concluded from this study that there was no histological difference between the accessory sex glands of rams and bucks.

دراسة نسيجية للغدد التناسلية الملحقة في ذكور المجترات الصغيرة في الأغنام المحلية (*Ovis aris*) والمعز المحلي (*Caprus hircus*)

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الخلاصة

أوضحت نتائج البحث ان المقاطع النسيجية للحوصلة المنوية في الاكباش وذكور الماعز (تيس) تمتلك طيات في الغشاء المخاطي نوع الغشاء الطلائي العمودي البسيط تتخللها خلايا قاعدية تتميز بأنوية مدورة تميل للبيضاوية. الغدة تصنف على أنها غدة أنبوبية سنخية وأحيانا أنبوبية مركبة طبقا للمقطع النسيجي، محفظة الغدة تتشكل من نسيج ضام رخو (ألياف عضلية ملساء وكولاجينية) وتكون ذات تفاعل موجب مع صبغة الماسون ثلاثية الكروم.

أما الغدة البصلية الاحليلية لها وحدات إفرازية بأشكال وحجوم مختلفة تظهر في المقاطع النسيجية سنخية، كيسية، أنبوبية الشكل ولهذا السبب الغدة تصنف أنبوبية سنخية ومحفظة الغدة تتكون من نسيج ضام كثيف يشمل ألياف كولاجينية ومرنة وألياف عضلية مخططة. هذه المحفظة ترسل حويجزات التي تتغلغل بين الوحدات الإفرازية لتستمر مع الصفيحة الأساسية للطبقة تحت المخاطية وتقسم الغدة إلى فصيصات.

بينما كانت غدة البروستات من النوع المنتشر في الكبش والتيس بصورة عامة (لا وجود لجسم الغدة) ونسيج الغدة ينتشر حول وبين طيات جدار الاحليل الحوضي وكانت غدة البروستات واضحة في المقاطع النسيجية كغدة أنبوبية سنخية وهذه الاسناخ مبطنة بنسيج طلائي عمودي بسيط والمقاطع النسيجية بينت ان النسيج الطلائي لغدة البروستات يتغير إلى النسيج الطلائي العمودي الكاذب.

وأظهرت النتائج النسيجية بينت وجود خلايا عضلية طلائية حول سنخات البروستات والغدة ذات إفراز مخاطي أعطت تفاعل موجب مع صبغة الشيف فوق الايودي(PAS) .

والمقاطع النسيجية لانبورة الاسهر حيث يصنف التجويف الغدي بأنه نوع الأنبوبي المتفرع نتيجة لوجود طيات الغشاء المبطن لها والذي يبرز داخل التجويف الأنبوبي للجزء الغدي. المقاطع النسيجية بينت وجود نبيبات واسعة وأخرى مبطنة بغشاء طلائي عمودي بسيط وغشاء طلائي عمودي متعدد الطبقات يتميز بوجود نوى دائرية الشكل. بصورة عامة لم يلاحظ خلال الدراسة هذه وجود فروقات نسيجية للغدد التناسلية الملحقة في الكبش والتيس.

Introduction

Ampullae is the terminal portion of the ducts deferens (vas deferens) and was described as a branched tubule-alveolar gland. The lumen is wider and the mucosa is much more folded than in the main portion of the ducts deferens and releases the serous secretion (1,2,3,4) In the stallion, bull and ram, these glands occupy practically the entire propria-submucosa, which is rich in smooth muscle cells. The ampullae is lined by the simple columnar epithelium, many of the epithelium fold branches and fuse with each other producing a number of pocket like recesses.

The paired vesicular glands are a compound tubular or tubule alveolar gland. The glandular epithelium is both simple columnar or pseudo-stratified columnar epithelium with tall columnar cells and small, spherical, basal cells, the interlobular and main secretary ducts are lined by a similar, simple cuboidal or a stratified columnar epithelium (2,5,6,7). The epithelium rest on a lamina propria-submucosa which consist of a loose connective tissue that is richly vascularized which is continuous with the dense-connective tissue trabeculae, which may subdivide the organ into lobes and lobules.

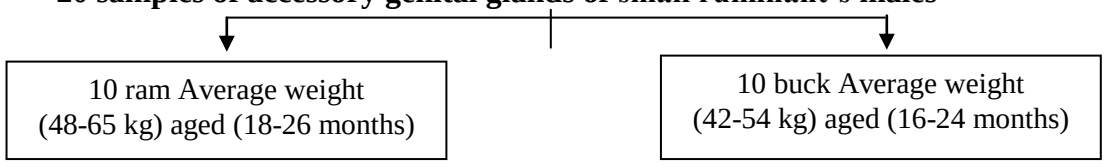
The prostate consist of a varying number of individual tubulealveolar glands derived from the epithelium of the pelvic urethra. Two portions may be distinguished: the compact or external portion, and the disseminate or internal portion the external portion either entirely surrounds part of the pelvic urethra at the level of the colliculus seminalis or covers part of its dorsal aspect. The disseminate portion is located in the propria sub mucosa of the pelvic urethra. In ram and buck the gland are distributed within the submucosa of pelvic urethra and they are a compound tubulealveolar structure lined by low cuboidal or low columnar secretary cells the cells have acidophilic granules and lipid droplets are present also. The mode of secretion is merocrine, secretary units showed a progressive decrease in size toward the posterior part of the pelvic urethra. The units were also widely separated by increasing amount of connective tissue posteriorly(5,7,8,9).

Bulbouretheral gland is located dorsolaterally to the pelvic urethra. Its compound tubular in boar, cat and buck, or tubulealveolar in stallion bull, ram and human. Its absent in the dog.(10,11,12) The gland is surrounded by a thin connective tissue capsule, containing a variable amount of skeletal muscle fibers and septa pass into the gland to divide it into lobules. The connective tissue septa contain numerous elastic fibers, skeletal and smooth muscle fibers.(2,13)

The aim of this study was designed to study the distinctive histological of male accessory genital glands in local Iraqi male, sheep and goat**.**

Materials and Methods

The study included the following samples:



All these samples collected from the Baghdad slaughter house.

The histological procedures are doing by using automatic processor histokinate technique:

1. The samples were taken immediately after slaughtering within 15-20 minutes and fixed in solution of 10% formalin solution prepared according to (14) for (48) hours and washing by tap water for 8 hours period to remove the formalin .
2. Dehydration by using aggraded series of ethyl alcohol (70 % till100 %).
3. Clearing by using xylen.
4. Embedding until the tissue completely infiltrated by paraffin (57-60 C˚).
5. Blocking
6. histological sections were done by manual rotary microtome (5 µ) microne thickness.
7. Staining by the following stains:

The sections were stained with the following stains:

1. Harris Hematoxylin and Eosin (14,15) for general histological constructions of the tissue.
2. Periodic Acid Schiff (PAS)(16) for mucopolysacharides, glycoprotein and basement membrane, the poly sacharides appeared red in color (purple)in positive reaction.
3. Verhoeff-Vangieson Stain(14) for Connective Tissue and Muscle Fibers.
4. Masson Trichrome Stain(16) for collagen and smooth muscles.

Results and Discussion

The histological study of ampulla in ram and buck shows that the ampulla has branched tubular lumen due to presence of many folds of lining epithelium projected into the lumen of these tubule (Fig.1 and 2). The lumen of the ampulla changed from narrow tubules lined by pseudostratified columnar epithelium and became more larger lining by simple columnar epithelium characterized by rounded nuclei (Fig.3 and 4), this observation similar to that results reported by other workers.(1,3,4,) The Ampullae sharing in ejaculatory apparatus with seminal vesicle gland.

The duct of ejaculatory apparatus is lined by pseudostrafied columnar epithelium; this finding is described .(17,18)

The histological sections of seminal vesicle in ram and buck showing folded epithelial mucosa which consists of simple columnar epithelium with basal cells in between which characterized by spherical to ovoid nuclei (Fig. 5, 6 and 7). The gland classified as tubuloalveolar or sometime compound tubular gland according to the section. The gland has capsule consist from loose connective tissue of collagen and smooth muscle fibers, giving positive reaction with masson trichrom stain (Fig. 9). It is parallel with theobservations of many workers.(5,6,13) According to(10,19) in bull and in man (20) reported that the alveoli of seminal vesicle lined by pseudostratified columnar epithelium.

The study revealed the seminal vesicle of ram and buck has a capsule sent septi which divided the gland into lobules (Fig. 8 and 9).

The prostate gland in ram and buck has only the disseminated portion because its glandular tissue distributed through the submucosal layer of pelvic urethra. The prostate glands distinguished histologically as tubuloalveolar type with well developed alveoli (Fig. 16 and 17). These alveoli lined by simple columnar epithelium as this finding is described in literatures.(5,7,8,9)

The present study showed the secretory units of bulbourethral gland in ram and buck has different shapes and sizes, in most sections seen as alveolar shape and others are between saccular or tubular shape for this reason the gland classified as tubuloalveollar gland (Fig. 10, 11, 12, 13 and 14).

The bulbourethral gland has capsule consisted of dense connective tissue includes collagen, elastic fibers, smooth muscle fibers and striated muscle fiber ,This capsule send septi which invaded in between the secretary units and continuous with lamina proparia of submucosa that divided the gland to tubules (Fig. 11 and 15) It was concluded from this study that there was no histological difference between the accessory sex glands of rams and bucks.

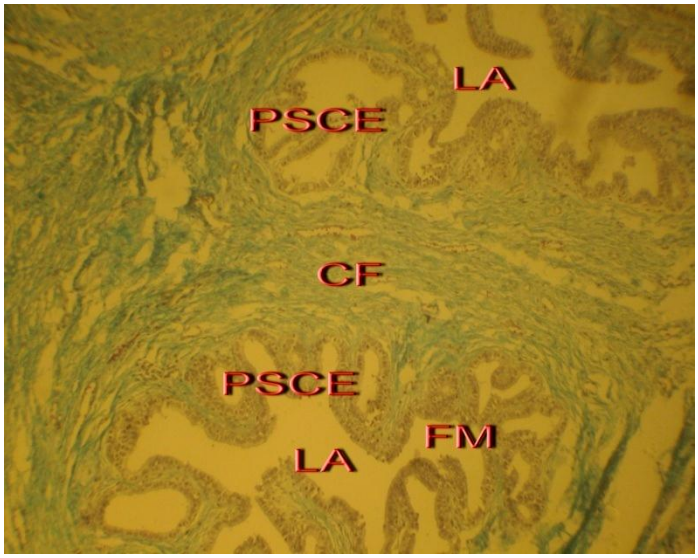


Fig. (1) Micrograph of the ampullae (cross-section) showing lumin of ampullae (LA), collagen fiber (CF) pseudo stratified columnar epithelium (PSCE), folded mucosa (FM) intralobular septa compose from very thick collagen fiber separate the two ampullae (CF) in ram (Masson trichrom stain 40X)

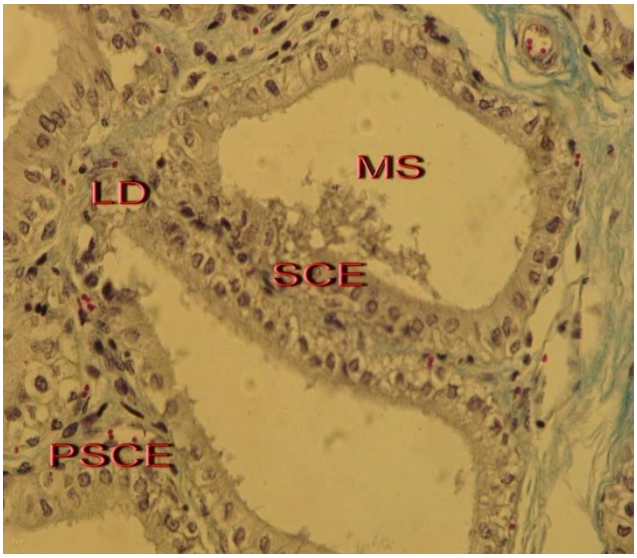


Fig.(2) Micrograph of the ampullae showing simple columnar epithelium (SCE), pseudostratified columnar epithelium (PSCE), lipid droplet (LD), merocrin secretion (MS) in ram (Masson trichrom stain 100X)

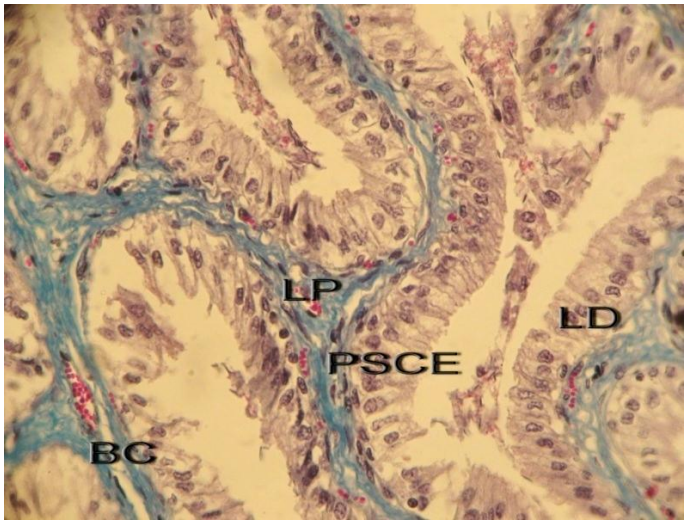


Fig. (3) Micrograph of ampullae showing the pseudostratified columnar epithelium (PSCE), lipid droplet (LD), lamina proparia (LP) and basal cell (BC) in buck, (Masson trichrom stain 100X)

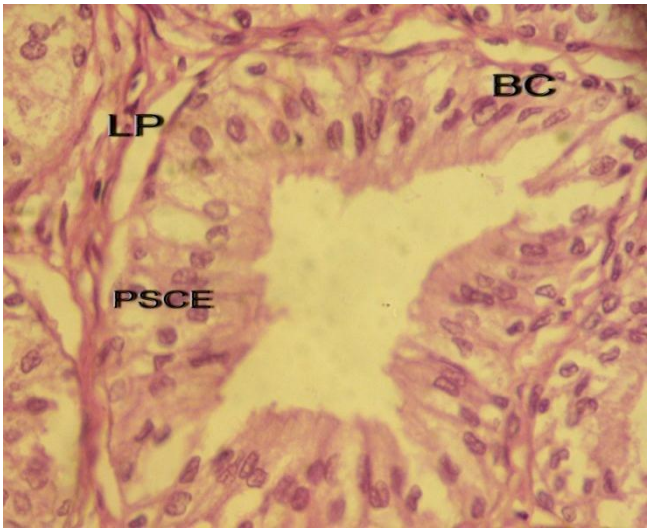


Fig. (4) Micrograph of ampullae showing the pseudostratified columnar epithelium (PSCE), lamina proparia (LP) and basal cell (BC) in buck, (H&E stain 100X)

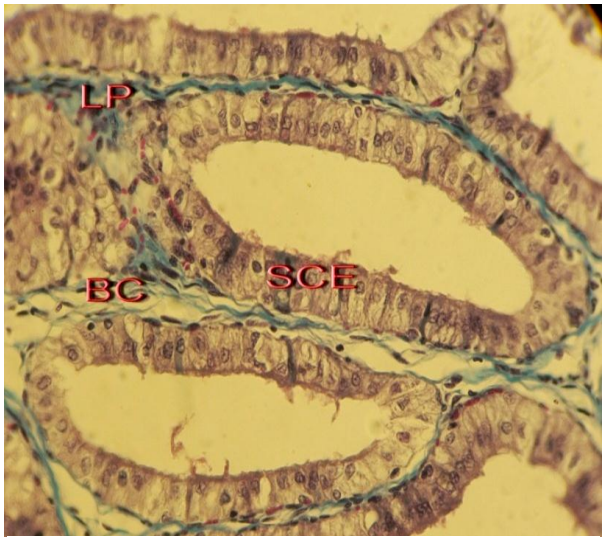


Fig. (5)Micrograph of vesicular gland showing the simple columnar epithelium (SCE),lumina properia (LP) and Basal cell (BC) in ram (Masson trichrom stain 40X).

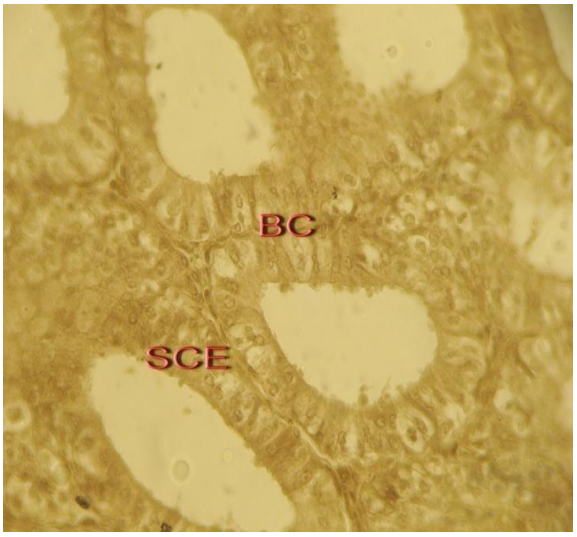


Fig. (6) Micrograph of vesicular gland showing the simple columnar epithelium (SCE), basal cell (BC) in ram (VanGieson stain 40X).

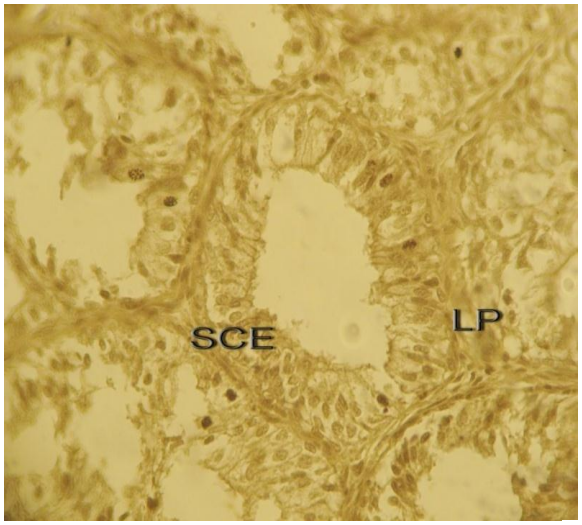


Fig. (7) Micrograph of vesicular gland showing the simple columnar epithelium (SCE), lumina properia (LP) in buck (Van Gieson stain 40X).

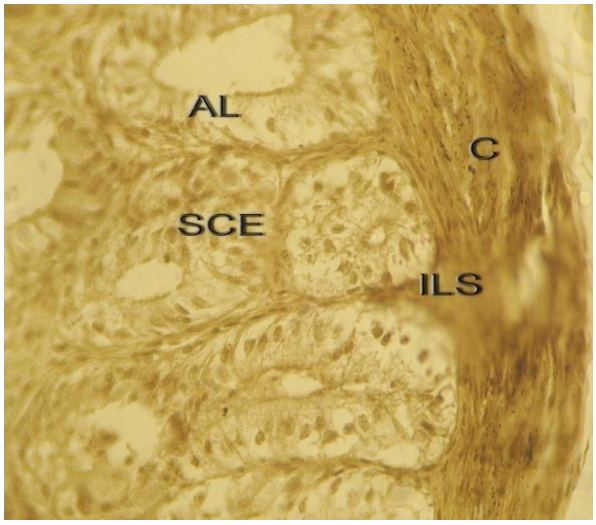


Fig. (8) Micrograph of vesicular gland showing the simple columnar epithelium (SCE), alveoli of the gland (AL, inter lobular septum (ILS) and capsule of the gland (C) in buck (Van Gieson stain 40X).

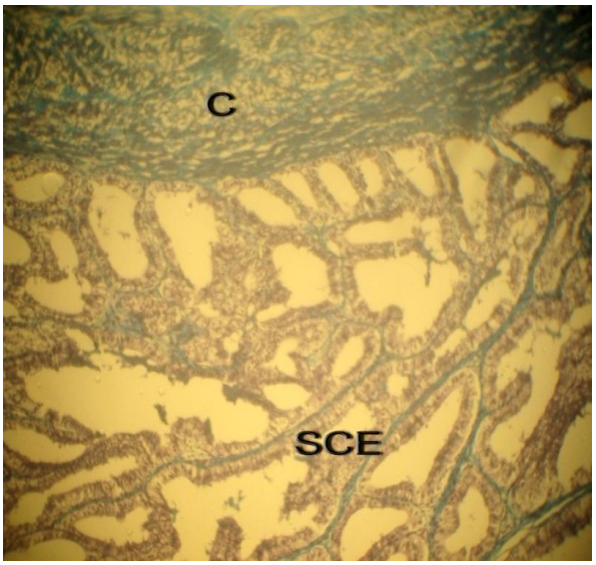


Fig. (9) Micrograph of vesicular gland showing the simple columnar epithelium (SCE) and capsule of the gland (C) in buck (Msson trichrom stain 10X).

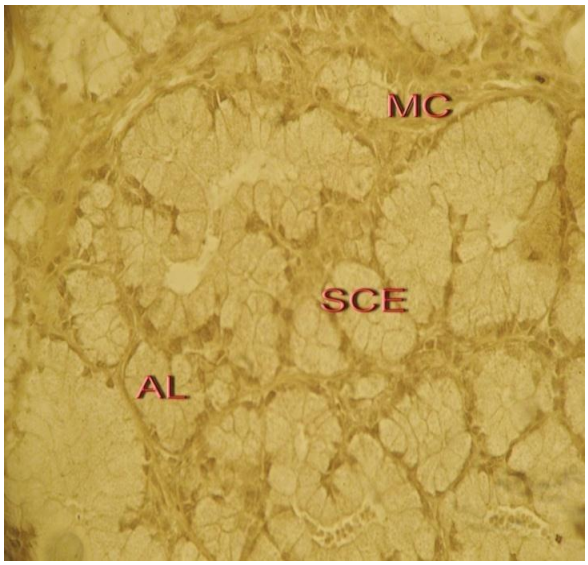


Fig. (10) Micrograph of bulbourethral gland showing the alveoli of the gland (AL) and myoepithelial cell (MC) and simple columnar epithelium (SCE) in ram (Van Gieson stain 10X).

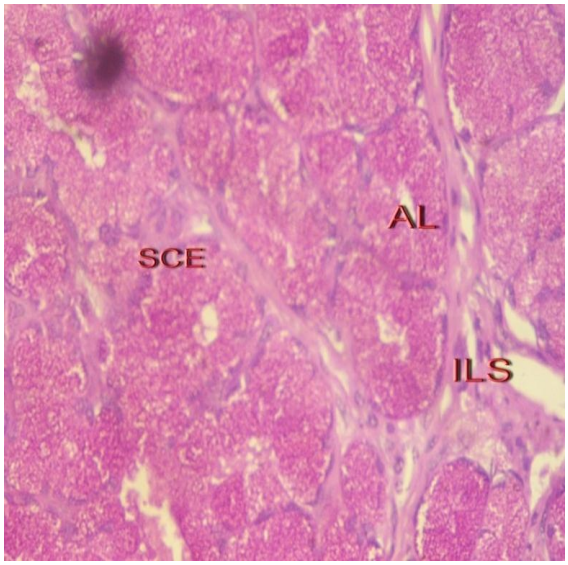


Fig. (11) Micrograph of bulbourethral gland showing the alveoli of the gland (AL), simple columnar epithelium (SCE) and inter lobular septum (ILS) in ram (PAS stain 40X).

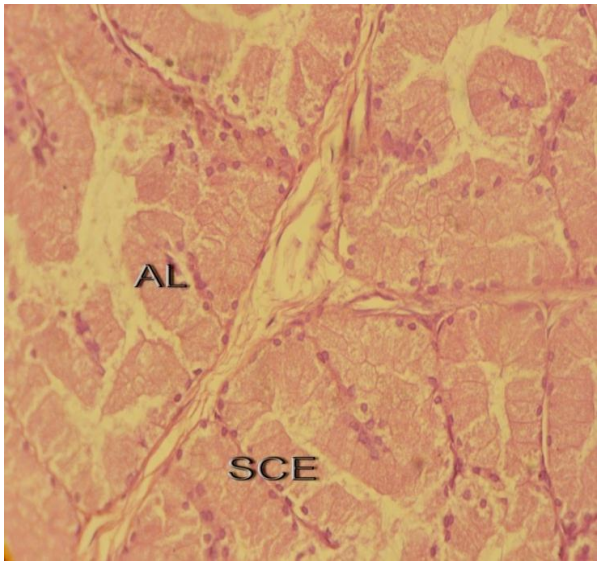


Fig. (12) Micrograph of bulbourethral gland showing the alveoli of the gland (AL) and simple columnar epithelium (SCE) in buck (H&E stain 40X).

Fig. (13) Micrograph of bulbourethral gland showing the alveoli of the gland (AL), simple columnar epithelium (SCE) and duct lumin (DL) in buck (Van Gieson stain 40X).

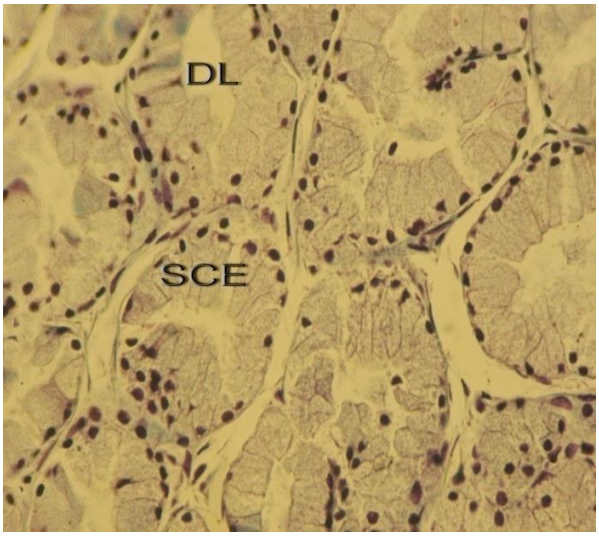


Fig. (14) Micrograph of bulbourethral gland showing the simple columnar epithelium (SCE) and duct lumin (DL) in buck (Masson trichrom stain 40X).

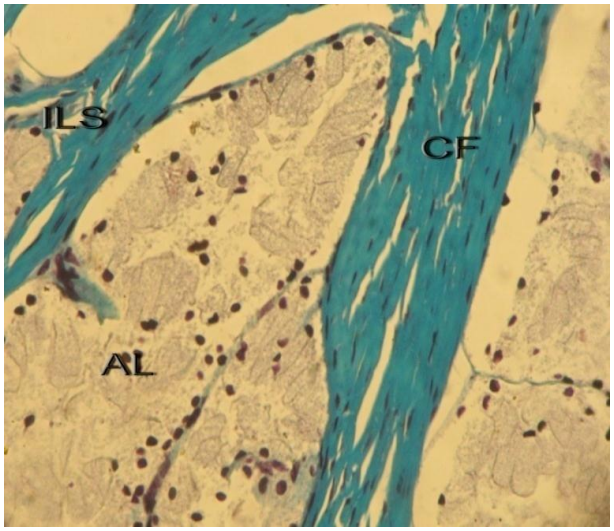


Fig. (15) Micrograph of bulbourethral gland showing the alveoli of the gland (AL), inter lobular septum (ILS) and collagen fiber (CF) in buck (Masson trichrom stain 40X).

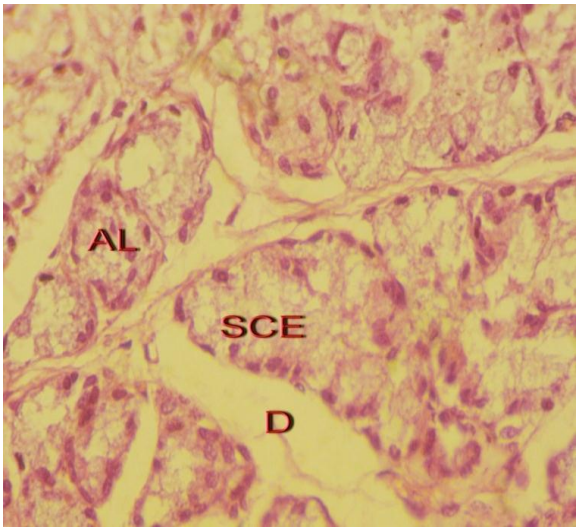


Fig. (16) Micrograph of prostate gland showing the alveoli of the gland (AL), simple columnar epithelium (SCE) and duct of the glan (D) in ram (H&E stain 40X).

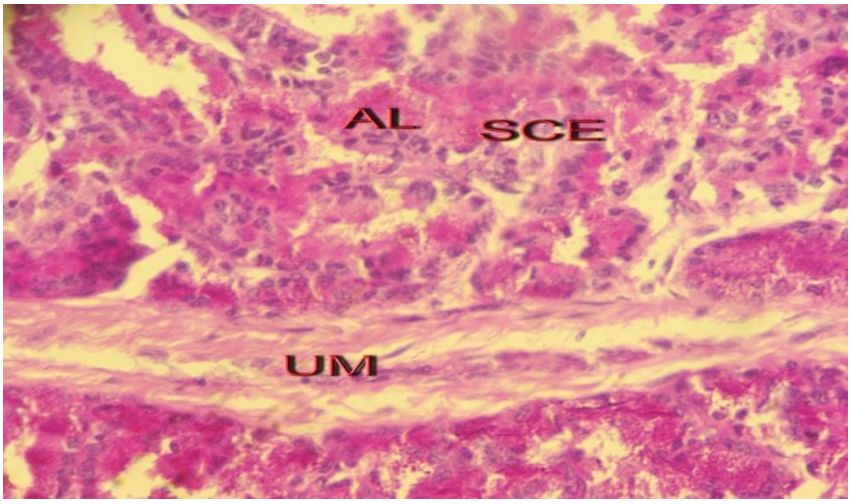


Fig. (17) Micrograph of prostate gland showing the alveoli of the gland (AL), simple columnar epithelium (SCE) and urethral muscle (UM) in ram (PAS stain 10X).

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