Gross Morphology of the Coagulating and Preputial Glands of Albino Rat (*Rattus norvegicus*)

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ABSTRACT

The coagulating and the preputial glands were the two additional paired accessory sex glands along with the prostate, Cowper's and seminal vesicles in the male genital system of rat. The right coagulating gland was located slightly outside of the inner curvature while the left was located along the inner curvature of the seminal vesicle. The distal end of each gland formed a single narrow duct that opened separately into the urethra alongside the duct of the seminal vesicle. The preputial glands were small and elongated flask shaped structures in the dermis of the prepuce on either side of the penis in the male. Each gland had a duct which opened independently into the area between the inner surface of the prepuce and glans penis.

**Key words:** Albino rat, Coagulating gland, Gross Morphology, Preputial gland

The male genital system of most animals has the three accessory sex glands i.e prostate, Cowper's and seminal vesicles. Coagulating and preputial glands are additional accessory sex glands present in the male rat. Coagulating gland helps to create a copulatory plug to ensure fertilization. The prostate of rat is consisted of ventral, dorsal, lateral and anterior lobes. Its secretion is responsible for initiation of semen coagulation. Preputial glands are small lobulated structures which open into the area between the prepuce and glans penis. Wheatley (1986) described that preputial glands were exocrine glands that produced pheromones and resembled the sebaceous glands. Similar type of glands in the female rats were called clitoral glands.

The present study was undertaken to gain a thorough knowledge of these glands.

MATERIALS AND METHODS

The male accessory sex glands were collected from ten albino rats sacrificed from the control group of the experiments conducted with the approval of Institutional Animal Ethics Committee in the Department of Pharmacology and Toxicology, NTR College of Veterinary Science, Gannavaram. A mid ventral incision was given and the accessory sex glands complex was dissected out by cutting the ductus deferens and urethra. The coagulating glands were separated from the accessory sex glands complex. The preputial glands located near the penis in the preputial sheath were also dissected out.

RESULTS AND DISCUSSION

The coagulating glands were the additional paired accessory sex glands in the male genital system of the rat. They were closely but asymmetrically located along the inner curvature of the seminal vesicles of either side. The right coagulating gland was located slightly outside of the inner curvature and was free of the connective tissue sheath of the seminal vesicle, while the left coagulating gland was connected along the inner curvature of the seminal vesicle. They were grossly distinct and had a different overall structure compared to the dorsal prostate. The distal end of each gland formed a single narrow duct that opened separately into the urethra alongside the duct of the seminal vesicle (Fig. 1).

Several authors reported a common embryological origin for the coagulating gland and the prostate gland and hence, referred to the coagulating gland as the anterior prostate (Price, 1963). However, in the present study, the coagulating gland was located anterior and away from the
prostate gland along the inner curvature of the seminal vesicles as reported earlier (Chiasson, 1969).

Wilson and French (1980) also described that the rat dorsal prostate and coagulating glands were anatomically distinct organs and no structural association could be found between the coagulating gland and dorsal prostate. They also reported that each coagulating gland had a single duct that drained into the urethra. However, they too referred to the coagulating glands as anterior, cranial, or dorsocranial prostate. Hayashi et al. (1991) also supported the views of the above authors and opined that the rat prostate was a large gland, which surrounded the urethra and was composed of several distinct lobes i.e. the ventral, lateral, dorsal and anterior lobes (coagulating gland). Smallwood (1992) described that coagulating glands were large and lobulated. Tamanao et al. (1996) stated that the anterior prostate was commonly referred to as the coagulating gland but unlike the other prostate lobes, extended parallel along the paired seminal vesicles which were also derived from the Wolffian duct. Suckow et al. (2006) described that the coagulating glands were in close association with the vesicular glands.

The preputial glands were small and elongated flask shaped structures in the dermis of the prepuce on either side of the penis in the male. Each gland had a duct which opened independently into the area between the inner surface of the prepuce and glans penis (Fig. 1). Beaver (1960) reported that the paired preputial glands in the rat resembled a flattened club, were similar to those of the mouse and were subcutaneous in position on each side of the midline of the genital region. The excretory duct of each gland ran along the lateral side of the penis and opened independently alongside the urethral opening. A network of blood vessels was seen upon the dorsal surface of each gland. A difference between the preputial glands in the rat and mouse was also that in mouse an intimate association of preputial gland with central hair follicle persisted throughout the lifetime of the animal but this was not observed in the rat.

Chiasson (1969) described that the preputial glands were lobulated structures in the prepuce which opened into the area between the prepuce and glans penis. Smallwood (1992) described that the preputial glands were on either side of the penis beneath the prepuce. Suckow et al. (2006) described that the preputial glands were beneath the skin of prepuce.

REFERENCES


