

سامية محمد مصطفى



شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم



سامية محمد مصطفى



شبكة المعلومات الجامعية



شبكة المعلومات الجامعية التوثيق الالكتروني والميكروفيلم



سامية محمد مصطفى



شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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بالرسالة صفحات لم ترد بالأصل



**POSTNATAL STRUCTURE AND DIFFERENTIATION
OF THE EPITHELIAL CELLS OF THE EPIDIDYMS OF
ALBINO RATS AND THE EFFECT OF VASECTOMY
ON EPIDIDYMS AND TESTIS**

Thesis

*Submitted in Partial Fulfillment
of the M.D. in Anatomy*

By

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

سَنُرِيهِمْ آيَاتِنَا فِي الْأَفَاقِ
وَفِي أَنْفُسِهِمْ حَتَّىٰ يَتَبَيَّنَ لَهُمْ أَنَّهُ
الْحَقُّ أَوَلَمْ يَكْفِ بِرَبِّكَ أَنَّهُ عَلَىٰ
كُلِّ شَيْءٍ شَهِيدٌ

"سُورَةُ فَصَّلَتْ"

آيَةُ (٥٣)

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INTRODUCTION



INTRODUCTION

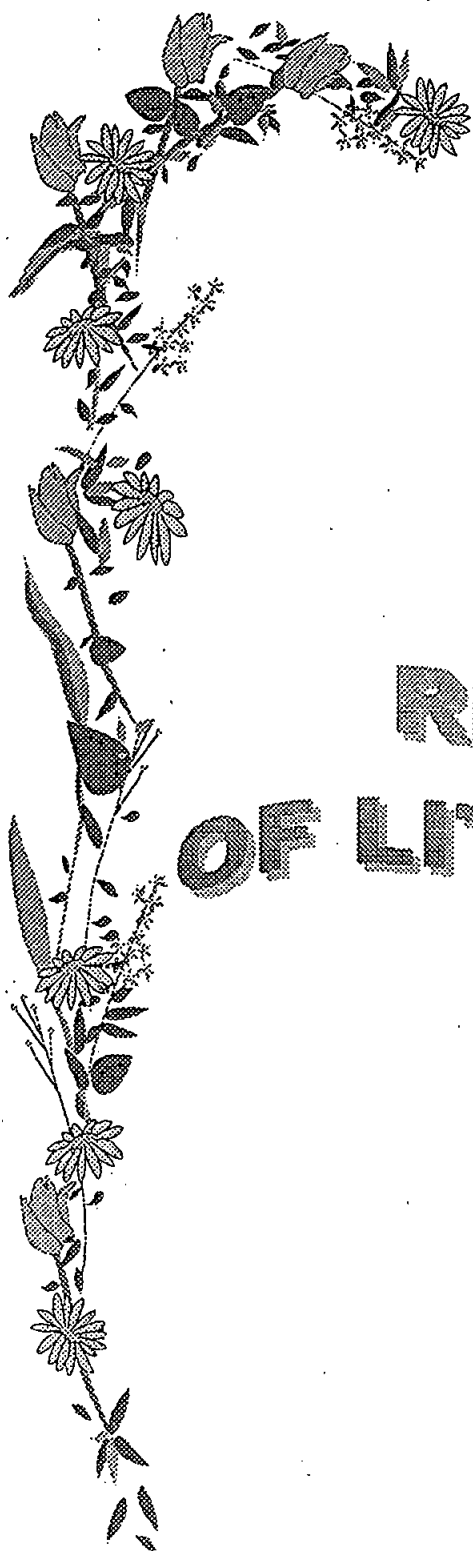
The epididymis has secretory and absorptive functions that are believed to be related to the maturation and storage of sperms. These functions are carried out by the various cells of the epididymal epithelium (*Hermo, et al., 1992*). The postnatal development of these various cells of the rat epididymis has been studied at the level of the light microscope, but the information on the cytological aspects of postnatal epididymal development are lacking.

Because of the increasing use of vasectomy in human, it is important to determine the effects of vasectomy on the parts of the male reproductive tract. The local changes have been reported on the testis, epididymis and vas deferens (*Flickinger, et al., 1993*). Most of these studies reported the early or late effects of vasectomy on testis or epididymis. However, the pathogenesis of the testicular and epididymal response to vasectomy have been overlooked by light and electron microscopic analysis.

AIM OF THE WORK

This work aimed to study the followings:

- 1- Differentiation of the epithelial cells lining the rat epididymis at the 2nd, 5th and 8th postnatal weeks by light and electron microscopic analysis.
- 2- The light and electron microscopic analysis of the testis and epididymis of adult control rats.
- 3- The effects of vasectomy on the testis and epididymis at intervals 1,2 and 5 months by light and electron microscopic analysis.



REVIEW OF LITERATURE



ANATOMY OF THE EPIDIDYMIS

The mammalian epididymis is a single highly convoluted duct, closely applied to the testis and embedded in a variable amount of the epididymal fat. Depending on the species, the epididymis may be either firmly or loosely bound to the tunica albuginea of the testis. In human and monkey, the epididymis is firmly attached to the tunica albuginea of the testis by fibrous tissue, while in rat, the epididymis is loosely attached to the tunica albuginea (*Hamilton, 1972*). The epididymis of the adult rat lies posterolateral to the testis, while the vas (ductus) deferens lies posteromedial to the epididymis, a position similar to that found in the human (*Hebel and Stromberg, 1976*).

Generally, the epididymis can be divided grossly into three major parts; the head (caput), body (corpus) and tail (cauda). In adult rat epididymis, the caput is a semilunar in shape and connected to the cranial pole of the testis by the efferent ductules (vasa efferentia). The caput becomes narrow to form the corpus. The boundary between the caput and the corpus is indistinct grossly. The corpus continues as the club-shaped tail which extends 5-11mm beyond the caudal pole of the testis. The rat epididymal duct measures about 400cm, while the length of human epididymal duct varies between 500-600cm (*Hebel and Stromberg, 1976*).

The efferent ductules of the rat consist of five to seven ductules which arise from the rete testis and emerge on the supero-lateral aspect of the testis and extend through the epididymal fat to empty into the ductus epididymis (*Fawcett, 1994*). These efferent ductules become gradually

fuse with one another to form the single highly convoluted ductus epididymis (*Oke, et al., 1988*). The efferent ductules of the human consist of 12-20 ductules which perforate the tunica albuginea of the testis to join the epididymis. They are at first straight, then become enlarged and convoluted to form conical lobules which make up the head of the epididymis. These lobules open into the single duct of the epididymis whose coils form the epididymal body and tail (*Williams, et al., 1995*).

Vascular supply:

The rat epididymis is supplied by branches of the testicular and deferential arteries. The caput and the corpus epididymis receive arterial blood via a single branch from the testicular artery, which divides into the superior and inferior epididymal branches. The cauda epididymidis is supplied by branches from the deferential artery. There is some degree of anastomosis between the branches supplying the epididymis, although collateral branches between testicular and epididymal vessels are few. The veins of the epididymis drain into the pampiniform plexus, which becomes the spermatic vein. The lymphatics of the epididymis drain into the external iliac and internal iliac lymph nodes (*Hamilton, 1972*).

Nerve supply:

The epididymis receives both sympathetic and parasympathetic innervation from nerves derived from spermatic nerves, which in turn, arise from the superior hypogastric plexus and from the vesical plexus (*Tanagho, 1986*).

HISTOLOGY OF THE ADULT EPIDIDYMIS

The ductus epididymis consists of an epithelial lining which rests on the basement membrane and is surrounded by smooth muscle fibers and connective tissue. The epithelium is actually pseudostratified columnar epithelium because it contains both small basal cells and tall columnar cells. In the rat epididymis, five epithelial cell types have been identified, namely the principal, basal, apical, light and halo cells (*Hoffer, et al., 1973*).

1- Principal cells:

They are the major constituent of the epididymal epithelium. They are very tall in the caput, then gradually decrease in height along the duct, to become low columnar in the corpus and cuboidal in the cauda. They extend throughout the full thickness of the epithelium from the basal lamina of the duct to the lumen (*Hoffer, et al., 1973*). The free surface of each principal cell bears a tuft of very long, non motile stereocilia which in electron micrographs appear to be microvilli and have no basal bodies nor internal microtubules. Like microvilli, they contain an axial bundle of actin filaments that extends downward into a terminal web in the apical cytoplasm (*Fawcett, 1994*). The stereocilia differ from microvilli as they branch repeatedly near their bases. The cell surface between the stereocilia is irregular in contour with numerous invaginations, suggesting that these cells take up fluid from the lumen by pinocytosis (*Oke, et al., 1988*).