

THE HISTOLOGICAL AND MICROMETRIC ANALYSIS OF ADRENOCORTICAL NODULE IN HUMAN ADRENAL GLAND

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Introduction

Adreno cortico nodules (ACN) or the accessory adrenal glands are pearl white in color with various shapes and sizes present on the surface of the adrenal glands as extracapsular, intracapsular and related to coeliac ganglion. In majority of the glands they are located on the surface and peri capsular aspect of adrenals (Fig-1) with separate capsule. The ACN differ from adrenal gland in microscopic observation by absence of adrenal medulla. The thickness of adrenal cortex is reduced where presence of ACN. The nodules also found in fibro fatty tissue around the adrenals, inguinal region, around the spermatic cord, testes and broad ligament of uterus based on previous studies. The adrenal gland plays very important role to sustain life during stress & fear. The ACN resemble the cortex of adrenal gland in function.



Fig-1: Adreno cortico nodule on surface of Adrenal gland

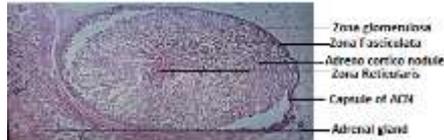


Fig-2: Microscopic structure of Adreno cortico nodule

Methods

The specimens were collected from post accidental death autopsy cases from government hospital kuppam with due consent and other formalities with ethical clearance for research purpose. The ACN was observed on the surface of adrenal gland postmortem number – 495/2020 belongs to hanging case of male age 45 years. Which was found during the meticulous dissection by removing the surrounding fibro fatty tissue around the gland. Cut section made at the level of presence of ACN after proper fixation in 10% formalin. The microscopic structure was observed after preparing the slide with haemotoxillin and eosin stains. The three zones of ACN was measured with using stage Micrometer (SM-100 units in slide placed in stage of microscope) and ocular micrometers (OM-100 units in disc fixed in eye piece) by calibration. The scale in SM was 1mm or 1000 micrometer divided into 100 units and there are 100 units in OM. The 40 units of OM were equal to 100 units of SM in 4x objective. So the distance between the two units in OM is 25 micrometer. The histological slide to be measured was placed in stage of internal light microscope and zone wise thickness was measured with OM and multiplied by 25 to convert into micrometer. These results were converted into mm by division of 1000 because of 1mm is equal to 1000 microns. The thickness of individual zone in mm was divided by total thickness of all the three zones of ACN and multiplied by 100 to convert into volumes in percentage.

Results

The ACN consists of Zona glomerulosa (ZG), zona fasciculata (ZF) and Zona reticularis (ZR). The ZG and ZF were stained with haemotoxillin and ZR stained with eosin as like microscopic structure of adrenal gland cortex. The cells in the ZG are poly gonal arranged like clusters. The sinusoids are radially or vertically oriented in ZF and the cells of zona reticularis occupied in central core of the nodule due to absence of medulla (Fig-2). The transverse diameter of ACN measured along the surface of adrenal is 114 ocular units (2.853mm) and antero posterior diameter of ACN measured at right angle to the surface of adrenal gland is 99 ocular units (2.484mm). The thickness of Zona glomerulosa, zona fasciculata and Zona reticularis were 8 (0.211mm), 23 (0.575mm), 20 (0.508mm) ocular units respectively and the volumes of ZG, ZF, ZR are 16.3%, 44.4%, 39.3% respectively (Table-1).

Table no.1. Thickness and volume of adreno cortico nodule

Sl no	Units	TD	APD	ZG	ZF	ZR
1	Measured Ocular units	114	99	8	23	20
2	Thickness micrometer	2853	2484	211	575	508
3	Thickness millimeter	2.853	2.484	0.211	0.575	0.508
4	Volume percentage	-	-	16.3%	44.4%	39.3%

Conclusion

The adreno cortico nodule is found on the peri capsular aspect of adrenal gland is very rare developmental anomaly of cortical tissue which consists of only ZG, ZF and ZR and no medulla. The ratio of zonewise thickness of nodule resemble the adrenal cortex. The transverse diameter is more than the antero posterior diameter. The importance of this poster is helpful to differentiate the ACN from benign and malignant tumors, lymph nodes, surrounding structures like sympathetic ganglion, chromaffin tissue, during the surgeries, histo pathological and radiological examinations.