

Histogenesis of Fetal Parotid Gland

¹Dr. M.Sushma. ²Dr.D.Asha Latha. ³Dr.M.Sri Hari Babu, ⁴Dr. Deena Usha,
⁵Dr. L. Lakshmi Sailaja.

^{1,2,3,4,5}Department of Anatomy, Andhra Medical College, Visakhapatnam.

Abstract: An analysis of the normal salivary gland structure permits a morphogenetic approach to an understanding of the variability in histologic types of salivary gland tumors. In the present study parotid gland specimens were collected from 25 aborted fetuses (8 male and 17 female) which were fixed in formalin. The fetuses were between 10 weeks to 40 weeks of gestational age. The dissected specimens were preserved in 10% formalin and subjected to routine histological procedure for age related histogenesis and developmental anatomy. In present study we observed that major histogenesis occurred during the mid trimester that is around 24 wks of gestation. And at 40 wks of gestation acini are approaching adult appearance.

Key words: parotid gland, solid epithelial cords, mesenchyme, acini.

I. Introduction

The major salivary glands arise by the in-growth of oral epithelium into the underlying mesenchyme. It is regarded as being developed from stomodeal ectoderm. The first of salivary gland to make appearance is the parotid gland, around the middle of the sixth week and it is almost entirely serous. The primordial cell mass destined to give rise to the epithelial part of the gland is formed by rapid proliferation of the cells in the deep layer of the epithelium. The resulting cellular mass pushes into the underlying mesenchyme first as solid epithelial cord [5]. When the distal end of this primary cord has pushed out to the location where the secretory part of the gland is destined to be formed it branches repeatedly. Age-induced variations and reactive changes include oncocyte proliferation, fatty infiltration, squamous and mucous metaplasia, hyperplasia, atrophy, and regeneration. An analysis of the normal salivary gland structure permits a morphogenetic approach to an understanding of the variability in histologic types of salivary gland tumors [11]. Characteristic morphogenesis and cytodifferentiation occurred in glandular duct cells during the period of mid trimester (intermediate development stage -19 to 32 weeks) and third trimester. In the late third trimester (late development stage -33 to full term), acini and ducts of the salivary glands histologically developed into a mature state similar to adult gland [9].

II. Material and Methods

A total of 25 formalin preserved fetuses with relevant obstetric records available in the department of Obstetrics King George hospital, Andhra medical college were utilized for this study. The fetuses from 10 weeks to 40 Weeks of gestational age of both the sex were collected. Fetuses were preserved by injecting 10% formalin solution into the pleural, peritoneal and the cranial cavities. Their extremities were preserved by multiple injecting techniques [10]. By dissection method we collected the parotid specimens. All the specimens were categorized in to four groups based on gestational age. The specimens were preserved in 10% formalin subjected to routine tissue procedure, and stained with haematoxylin and eosin stain.

III. Results

In the present study a total of 25 aborted fetuses of different gestational ages of both sexes were observed [Table -1]. The prenatal specimens are categorized in to gestational age groups of 10 to 20 weeks, 20 to 30 weeks, and 30 to 40 weeks. One representative sample of parotid tissue from each gestational age group was processed for routine histological examination

| Gestational age (weeks) | Male (8) | Female (17) | Total |
|-------------------------|----------|-------------|-------|
| 10-20 | 2 | 1 | 3 |
| 20-30 | 3 | 6 | 9 |
| 30-40 | 3 | 10 | 13 |
| | | | 25 |

Images 1 & 2

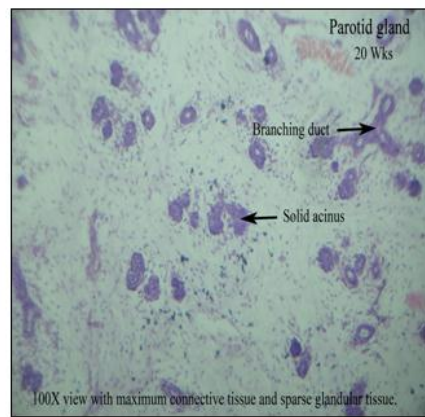
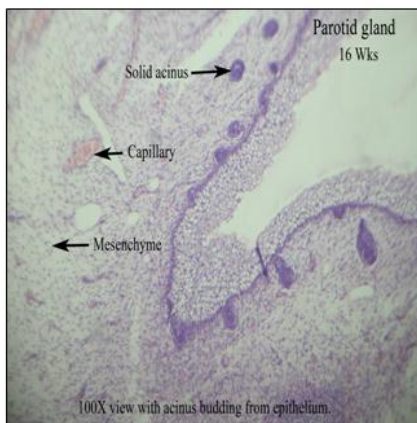


Image 1: microscopic picture of Parotid gland of 16weeks, showing solid epithelial cords projecting into the surrounding mesenchyme
 Image 2: microscopic picture of Parotid gland of 20 weeks showing solid cords branching into duct system

Images 3 & 4

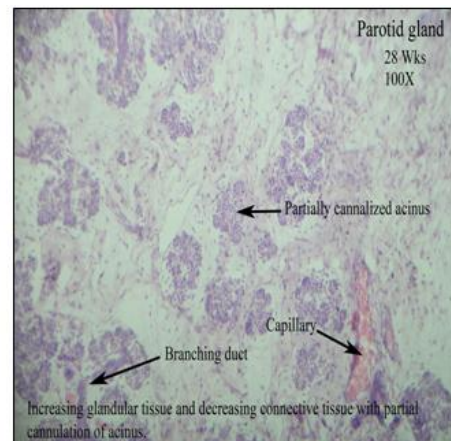
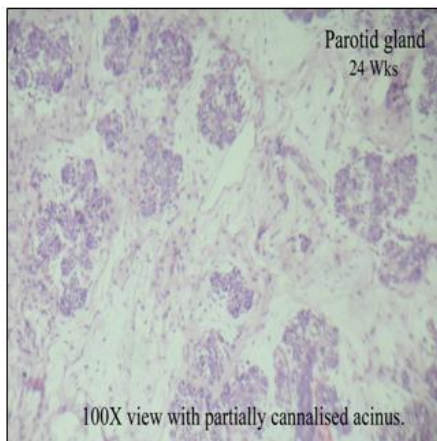


Image 3: microscopic picture of Parotid gland of 24wks showing connective tissue dividing glandular tissue into lobules
 Image 4: microscopic picture of Parotid gland of 28wks showing branching of ducts surrounded by acini

Images 5 & 6

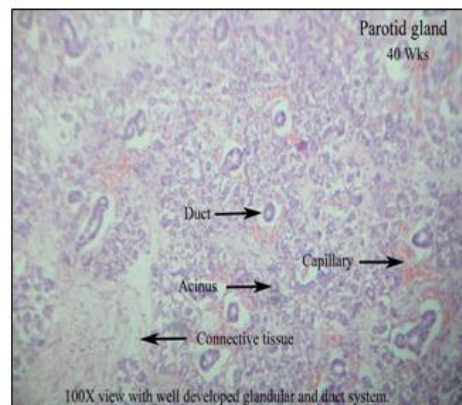
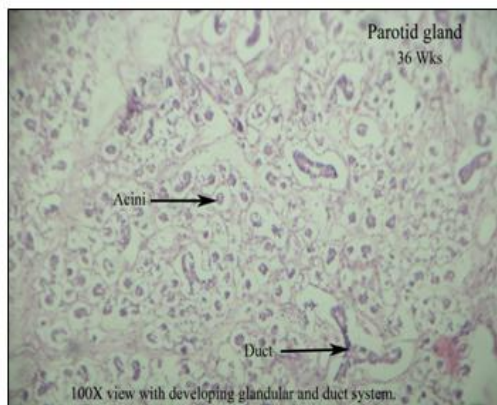


Image 5: microscopic picture of Parotid gland of 36weeks showing well developed glandular tissue
 Image 6: microscopic picture of Parotid gland of 40 weeks showing acini approaching adult appearance

IV. Discussion

We have observed that even at sixteen weeks, solid epithelial cords are projecting into the surrounding mesenchyme [img: 1]. And at twenty weeks solid cords branching into duct system are seen [img: 2]. According to LESLIE BRAINERD AREY, and BALINT J.ORBAN, the primordium arises as an epithelial bud and grows by branching into a bush like system of solid ducts, whose ends twigs round out into berry like secretory acini [3]. The finding in the present study is in agreement with the available literature.

Specimen with twenty four weeks of gestational age is showing that the connective tissue is dividing glandular tissue into lobules. And at twenty eight weeks branching ducts surrounded by acini are seen. Connective tissue is decreased considerably [img: 4]. According to MARIE A. VALDES-DEPENNA like pancreas, the salivary glands presents a considerable amount of connective tissue stroma early. This decreases as the gland develops further through fetal life and after birth [4]. The finding in the present study is in agreement with the available literature.

At thirty six weeks of gestational age well developed glandular tissue is seen [img: 5], and at Forty weeks of gestational age acini are approaching adult appearance [img: 6]. According to HAMILTON, MOSSMAN and BOYD, and BRADLEY M. PATTEN the solid epithelial cords develop lumen and by sixth month (24 wks) are completely canalized [2& 5]. We observed that there was delay in the complete canalization of the ducts and acini.

V. Conclusion

The findings in the present study stating that even at 16 weeks of gestational age solid epithelial cords projecting into the surrounding mesenchyme is observed. At 24 weeks of gestational age the connective tissue is dividing glandular tissue into lobules. At 28 weeks branching ducts surrounded by acini are seen & connective tissue is decreased considerably. At 36 weeks of gestational age well developed glandular tissue is seen. And at 40 weeks of gestational age acini are approaching adult appearance.

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