

Morphometric Analysis and Characterization of Teeth Extracted from Mature Cystic Teratoma of the Ovary

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ABSTRACT

Mature cystic teratomas are a form of ovarian germ cell tumor and often called 'dermoid cysts' because they are mostly cystic. Many teratomas have teeth with morphologically identifiable crowns and roots. The objective of this study was to carry out morphometric measurements of teratomatous teeth extracted from a mature cystic teratoma excised from a 28-year-old female patient. The extracted teeth were stored in normal saline till they were subjected to morphometric analysis. All measurements were done using digital calipers (Derby, France), repeated twice and the average was recorded. The teeth were labeled as teratomatous tooth 1 (TT1), teratomatous tooth 2 (TT2) and teratomatous tooth 3 (TT3). The gross morphology of TT1 resembled a maxillary deciduous canine whereas TT2 and TT3 resembled a deciduous incisor and a mesioden respectively. The teratomatous broadly resembled normal intraoral teeth. With all of them primarily resembling maxillary deciduous teeth it would not be out of place to postulate that the displaced embryonic tissue leading to the formation of these was from the upper front region of the stomodeum.

Keywords: Mature cystic teratoma, Dermoid cyst, Teratomatous teeth.

How to cite this article: Togoo RA. Morphometric Analysis and Characterization of Teeth Extracted from Mature Cystic Teratoma of the Ovary. *World J Dent* 2013;4(3):155-157.

Source of support: Nil

Conflict of interest: None declared

INTRODUCTION

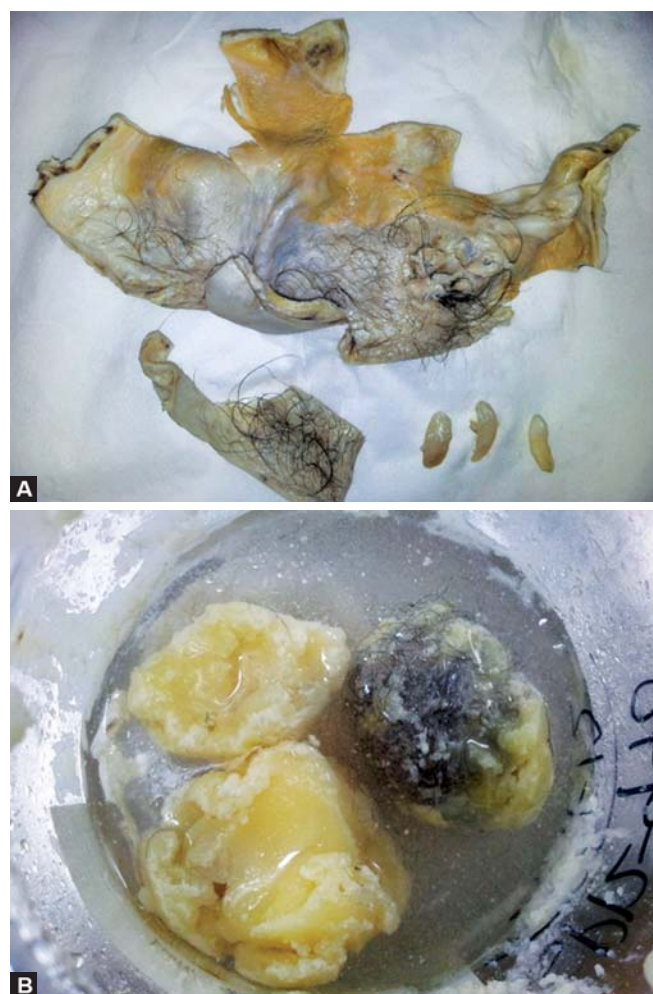
Mature cystic teratomas are a form of ovarian germ cell tumor. These tumors are often called 'dermoid cysts' because they are mostly cystic. Histologically, a variety of mature tissue elements may be found in these cysts (Fedele).¹ The most common tissue elements of these teratomas are skin, hair, teeth and sebum. Microscopically, these teratomas have hair follicles, cartilage, adipose tissue, intestinal glands and thyroid tissue. If these tumors are solid, then they are often 'immature' teratomas with less differentiated tissue and are more aggressive. Immature teratomas are less frequent but commonly undergo metastasis.

Teeth are normal appendages of the alveolar bones. They show a complex origin and developmental process. The enamel, like skin, is of ectodermal origin while dentin, cementum and pulp are mesodermal (ectomesenchymal) in origin. Many teratomas have teeth with morphologically identifiable crowns and roots. It is interesting these cysts have assorted teeth but an apparent alveolar bone like

structure is less common.² Devoize reported a cystic teratoma that had more than 300 teeth.³ The objective of this investigation was to carry out morphometric measurements of teratomatous teeth extracted from a mature cystic teratoma.

MATERIALS AND METHODS

Three teratomatous teeth were extracted from mass of a dermoid cyst for the purpose of this study (Figs 1A and B). The cystic mass was excised from a 28-year-old female patient suffering from pain, mild abdominal distention and amenorrhea. She was diagnosed by ultrasonography as having ovarian cystic teratoma based upon echogenic sebaceous material and calcification. Following surgical excision the microscopic findings included features of



Figs 1A and B: Mature hair follicles and sebaceous glands visible in the excised mass

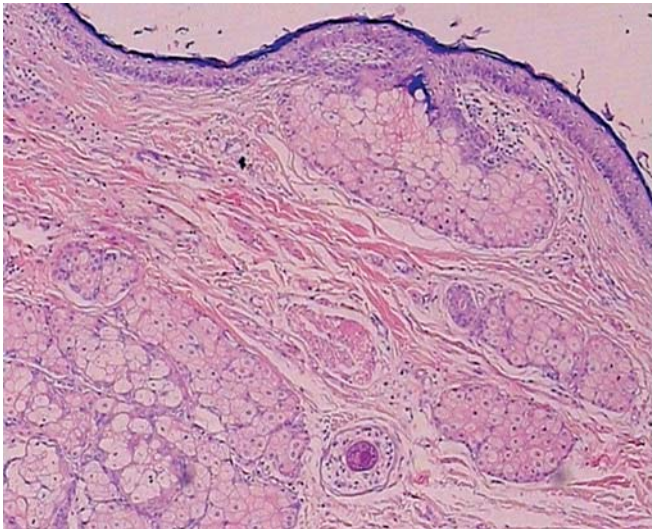


Fig. 2: Histopathological presentation of the mature dermoid cyst of the ovary

normal skin with attached adnexal components, such as primitive or mature hair follicles and sebaceous glands (Figs 1A, B and 2). The extracted teeth were stored in normal saline till they were subjected to morphometric analysis. The teeth were labeled as teratomatous tooth 1 (TT1), teratomatous tooth 2 (TT2) and teratomatous tooth 3 (TT3). The analysis involved measurements of labiolingual, mesiodistal, cervicoincisal and root lengths of all the three teeth in the study. Characterization was based on the measurements and gross morphology. All measurements were done using digital calipers (Derby, France), repeated twice and the average was recorded.

RESULTS

TT1 (see Figs 1A and B)—Resembling a Maxillary Deciduous Canine

All six aspects of TT1; labial, lingual, mesial, distal, incisal and root were easily identifiable. The crown and root measurements are given in Table 1. A solitary cusp, cusp

tip with unequal cusp ridges were observed. Labial ridge ran in the middle third cervicoincisally. The mesial and distal outlines converged toward the cervical line. On the lingual aspect a shallow lingual fossa, cingulum and faint lingual, mesial marginal and distal marginal ridges were visible. The mesial and distal aspects had a triangular geometric outline. Cervical line was convex apically on the labial and lingual sides and convex incisally on the mesial and distal sides. The root was almost one and half times the crown length (see Table 1). It was wider labiolingually than mesiodistally. It was straight in the cervical and middle third and displayed a proximal dilacerations in the apical third. Another noteworthy feature was that it was as broad in the apical third as it was in the middle and cervical third. Shallow grooves were observed on the mesial and distal halves in the apical third. The apical foramen was barely visible and apexification was complete. The gross morphology of TT1 resembled a maxillary deciduous canine.

TT2 (see Figs 1A and B)—Resembling a Deciduous Maxillary Incisor

Similar to TT1, all six aspects of this tooth were also identifiable. However, instead of the cusp a flat incisal ridge was visible. The incisal ridge was rounded with beveled mesial and distal incisal angles. The labial and lingual aspects were not easily identifiable. The only differentiating feature was the presence of a round elevation in the cervical third of the crown, which was akin to cingulum. Incisal to the cingulum there was a nonexistent lingual fossa, however very feeble mesial and distal marginal ridges could be made out. Labially the crown was more or less convex. Cervical line was clear and followed the same pattern as mentioned for TT1. The root was fractionally shorter than the root of TT1 (see Table 1). It was also curve in the middle and cervical third but without any grooves. The gross morphology suggested TT2 resembled a deciduous incisor.

Table 1: Morphometric measurements of teratomatous teeth (in mm)

<u>Crown</u> Tooth	<i>Cervicoincisal length</i>	<i>Maximum mesiodistal width</i>	<i>Mesiodistal thickness at cervical line</i>	<i>Maximum labiolingual thickness</i>	<i>Labiolingual thickness at cervical line</i>
TT1	5.32	3.84	2.87	5.02	3.88
TT2	3.32	3.2	3.14	3.95	3.62
TT3	3.24	3.15	3.12	3.87	3.7
<u>Root</u> Tooth	<i>Root length</i>	<i>Mesiodistal width</i>	<i>Labiolingual thickness</i>		
TT1	7.13	2.79	4.13		
TT2	6.37	2.44	4.07		
TT3	4.86	2.56	4.04		

TT3 (see Figs 1A and B) Resembling a Mesioden

In comparison with aforementioned teeth, this tooth appeared to be stunted. It had a visible crown and root of approximately same length (see Table 1). Because of convexity all around the labial, lingual, mesial and distal aspects were not easily identifiable. The incisal area was reduces to conical dome like elevation. The root was short and wider from one aspect than the other. The gross morphology of TT3 resembled a mesioden.

DISCUSSION

The formation of teratomatous teeth in ovaries is believed to be due to displacement of oral embryonic epithelium to site of developing ovaries. The ectopic tissue has an extensive differentiating potential. The proliferating epithelium induces condensation of underlying mesenchymal cells that constitutes to the tooth germ. Once the enamel organ, dental papilla and follicle are formed the formation of tooth ensues. The teratomatous teeth investigated in this report were small and few in number. Characterization of these teeth was mainly done by comparing the morphometrics with normal permanent⁴ and primary teeth.^{5,6} Measurements of TT1 and TT2 were close to the measurements of deciduous canine and incisor respectively. TT1 could possibly close to a maxillary right canine due to the following to reasons. The mesial and distal outlines convergence is common in maxillary canine while the coronal mesial outline is in line with the mesial outline of the root for mandibular canine. When viewed from the labial aspect the bigger cusp ridge was toward the right side, hence suggesting it to be a right canine. Incidentally the cyst was excised from the right ovary.

The size and absence of cusp with a beveled incisal ridge suggests that TT2 is a deciduous incisor. The maxillary deciduous incisors are normally wider mesiodistally than cervicoincisally. So was the case with TT2. TT3 resembled a typical mesioden with short root. The most common type of supernumerary tooth is the mesioden.⁷ It develops between the maxillary central incisors. Ramakant et al⁸ described eleven different morphologic types of mesiodens. TT3 resembles a conical mesioden with short root.

CONCLUSION

The teratomatous resembled normal intraoral teeth. With all of them resembling maxillary deciduous teeth it would not be out of place to posit that the displaced embryonic tissue leading to the formation of these was from the upper front region of the stomodeum.

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