

Benign Ovarian Cystic Teratoma: SEM and Morphological Study of Dental Structures: Case Report

İyi Huylu Over Kistik Teratoma: Dental Yapıların SEM ve Morfolojik İncelenmesi

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ABSTRACT Benign cystic teratomas are relatively common in reproductive age women, but they can occur at any age. Clinical and radiologic examinations have demonstrated the presence of mature dental organs inside the tumor and they were considered as being a pathognomonic sign. In this case report, it was aimed to describe a case of a 25-year-old female complaining of abdominal pain. The patient was examined radiographically and ecographically and tooth-like structures were appeared in the tumor. They were removed by surgical method. Tooth-like structures were examined in the light and scanning electron microscope (SEM). Normal pulpal tissue was observed following the light microscopy. SEM examination revealed calcospherites on the surface of dentin. The teratomatous teeth always present an altered coronal morphology. However, in this present report, normal enamel and cementum structure were observed.

Key Words: Teratoma, ovarian cysts, dermoid cyst; dental enamel; dental cementum; dental pulp

ÖZET İyi huylu kistik teratoma genel olarak doğurgan yaşta bulunan kadınlar arasında yaygın olmakla beraber, herhangi bir yaşta da görülebilir. Klinik ve radyolojik muayeneler patognomonik bir işaret olan tümör içinde gelişmiş dental yapıların varlığını ortaya koymuştur. Bu vaka raporunda 25 yaşında abdominal ağrıdan şikayetçi bir kadın hastanın sunumu amaçlandı. Hasta, radyografik ve ekografiksel olarak muayene edildi ve tümör yapının içinde diş benzeri oluşumlar görüldü. Bu yapılar, hasta onamı alındıktan sonar cerrahi yöntem ile çıkarıldı. Diş benzeri yapılar, (Taramalı elektron mikroskobu (SEM) ve ışık mikroskopunda incelendiler. Işık mikroskobisi incelemesi sonucu normal pulpa dokusu görüldü. SEM incelemesi kalkosferitlerin dentin üzerindeki varlığını gösterdi. Teratomatöz dişler daima değişik bir koronal morfoloji ile ortaya çıkarlar. Bununla beraber, bu raporda normal mine ve sement yapıları görüldü.

Anahtar Kelimeler: Teratoma, over kistleri, dermoid kist, diş minesini, diş sementi, diş pulpası

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Ovarian cystic teratomas, which are commonly observed as benign ovarian tumors, consist of the three primary germ layers of the embryo that are generally disorganized.^{1,2} Sebaceous material, cartilages, even thyroid tissue are frequently observed.³ Hair and teeth are the mature structures mainly encountered.⁴ Clinical and radiologic works underlined the presence of mature dental organs inside the tumor and they were considered as pathognomonic sign.⁵ The aim of the present study is to report the possible pathological and normal aspect of pulpal and hard-tissues of teeth inside a benign ovarian cystic teratoma by radiographically, histopathologically and in SEM.

CASE REPORT

A 25-year old woman complaining of permanent abdominal pain was examined radiographically and echographically. A tumor was determined. A creamy-like liquid, sebaceous material and tooth-like structures appeared in the tumor (Figure 1). They were removed by surgical method (cystectomy) after taking the consent form (Figure 2).

Two tooth-like structures were isolated by dissection and a radiograph was taken.

The pulp tissue was removed and fixed in formaldehyde and routine histopathological procedures were performed for light microscopy. Also, the hard tissues of tooth-like structures were fixed in Karnovsky solution for 24 h, rinsed in cacodylate buffer, dehydrated in gradient alcohol baths, critical point-dried and gold coated for SEM observations.

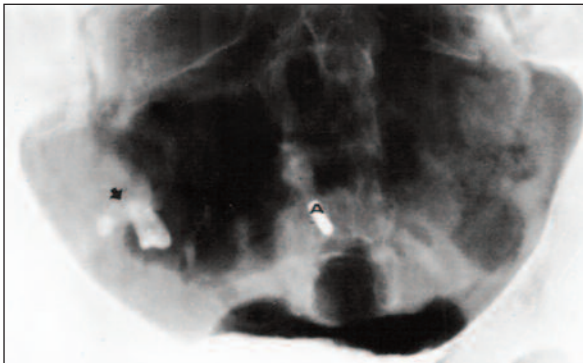


FIGURE 1: Radiographic aspect of tooth-like structures (arrow). (A; artifact).

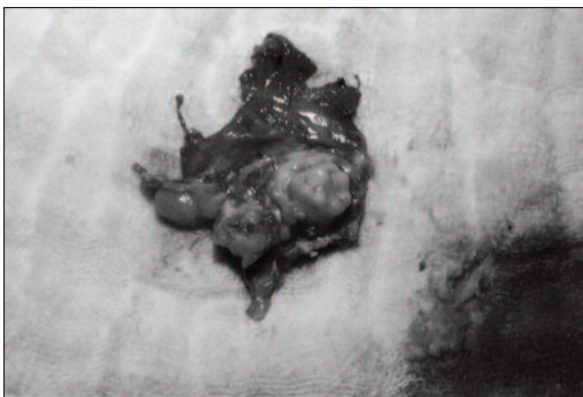


FIGURE 2: The cystic ovary which was removed surgically and inside dental structures.



FIGURE 3: Molariform and deformed premolariform tooth-like structures.

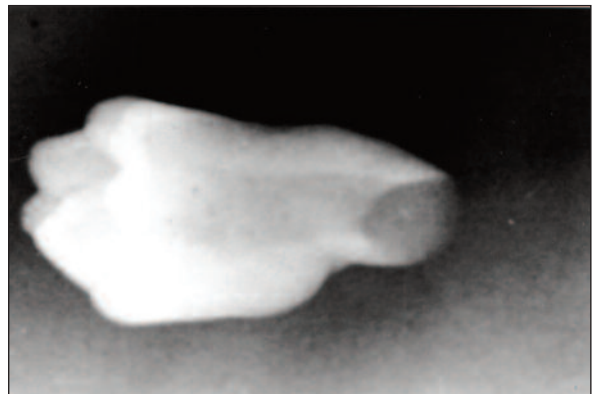


FIGURE 4: Radiograph of the molariform tooth.

Macroscopic examination revealed the presence of two calcified tissues which were molar tooth-like and abnormal tooth-like premolar (Figure 3). On the radiograph of the molar tooth-like structure, incomplete apex and wide pulp chamber were observed (Figure 4).

Two different microscopy techniques were used for detailed examination of teeth. Light microscopy was mainly preferred to investigate pulpal tissue of teeth (Figure 5). The examination result revealed that the teeth had similar pulpal tissue as permanent teeth in the jaws. SEM examination provided detailed information on the ultrastructural change of microarchitecture of teeth. Following the examination, the enamel on coronal surfaces was considered identical to those in the jaws which were perikymatias (Figure 6, 7). In addition, ce-

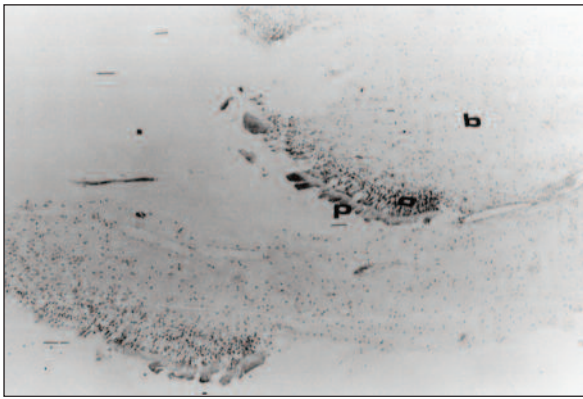


FIGURE 5: Pulp tissue on the light microscopy. (HEx50) (p: predentin, o: odontoblast, b: collagen tissue).

The surface of the dentin was irregular due to the presence of calcospherites and there were dentinal tubules on the calcospherites (Figure 10).

DISCUSSION

Ovarian mature cystic teratomas are common tumors especially during the reproductive period

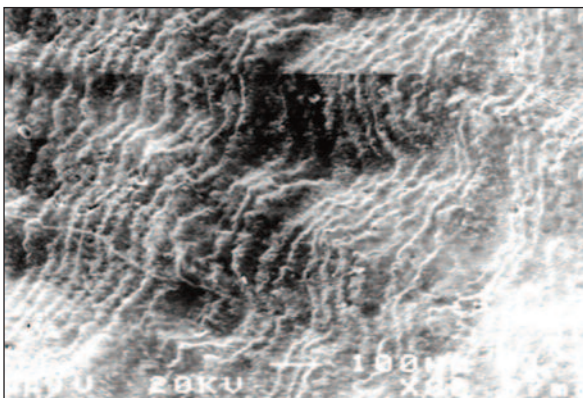


FIGURE 6: The SEM image of perikymatias on the enamel surface(X80).

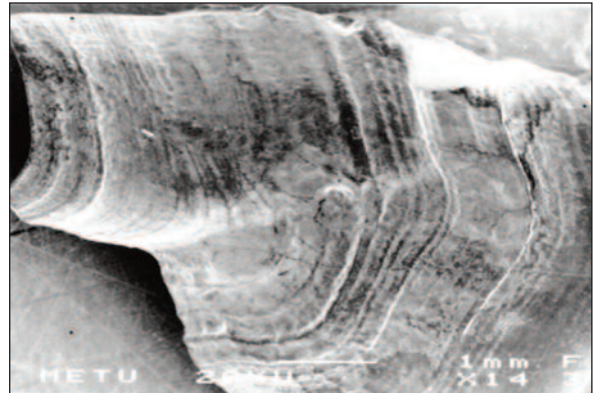


FIGURE 8: The SEM image of sement surface(X14).

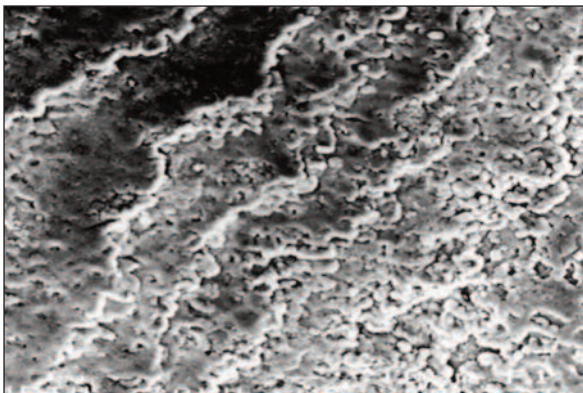


FIGURE 7: Perikymatias on the SEM image(X550).

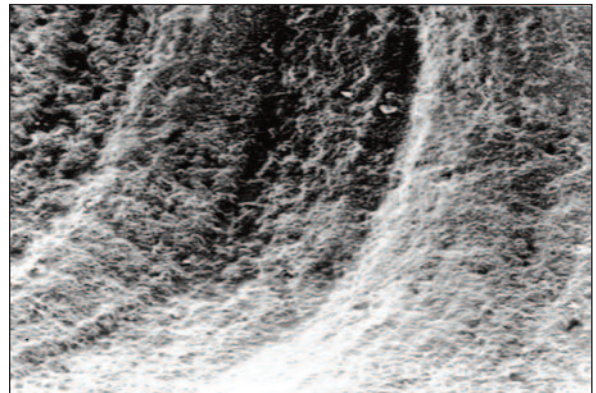


FIGURE 9: The SEM image of sement surface(X90).

mental surfaces were normal (Figure 8, 9). However, a calcospherite structure was observed on the surface of dentin. Predentin was removed in SEM preparation and the calcified dentin was observed.

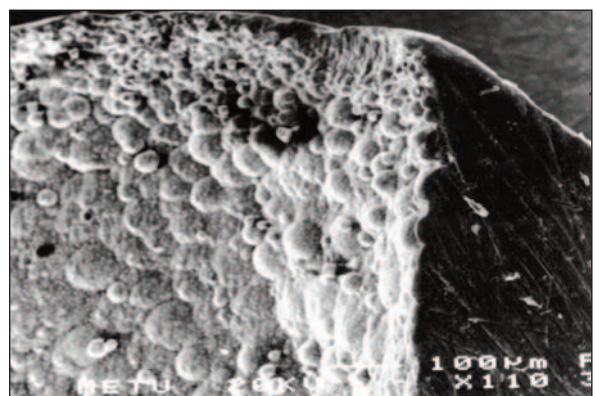


FIGURE 10: Calcospherites on the dentinal surface (SEM, X110).

with low rates of covert bilaterality, lead to complications and malignant transformation.^{6,7}

Pure teratoma that contains variable amounts of immature tissue can be derived from any of the three germ cell layers: ectoderm, mesoderm and endoderm.⁸ Sebaceous material, hair, cartilages, teeth, and even thyroid tissues are frequently observed.^{1,3,9} It may be revealed with an abdominal radiograph.⁹ In this case, sebaceous material and dental structures were observed.

Precise analysis of such tumors may significantly enhance our understanding about parthenogenetic and normal human development.¹ The altered tumor environment may influence genetic expression in tooth primordia sufficiently to result in atypical morphologies. Similarly, morphogenetic sequences fail to develop (except possibly in highly organized epignathi), possibly because of random and uncoordinated tooth initiation in the disorganized tissue environment that characterize teratomas. Clearly, the environment in some tumors is more conducive to "normal" morphologic development than in the others. Whether this is the consequence of nutritive factors, neural factors, tissue-inductive factors, field substances, or simply the effect of crowding is unknown. Nerve supply can influence morphological differentiation.²

The tumor environment in ovarian teratomas is conducive to the development of complex anatomic structures such as teeth.^{1,2} Although the tumor environment may not be conducive to accurate

morphological differentiations of teeth, those functions that are intrinsic to the tooth germ are expressed more or less normally.² Each class of teeth (incisor, canine, premolar and molar) may occur in teratomas.^{2,4} In this case, molariform and premolariform teeth were observed. Audiat et al⁴ have reported that the general morphology of teeth is nearly normal, several anomalies affect the different mineralized dental tissues such as enamel hypoplasia, irregular growth of cementum, altered predentin layer, and immature osteofibrous bony outgrowths.

Although a marked similarity between the enamel of the teratomatous teeth and those of unerupted teeth of the oral cavity was clearly demonstrated, teratomatous teeth always present an altered coronal morphology with areas of moderate to marked hypoplasia. These characteristics could be due to the abnormal site where the dental germ develops, to growth in association with tissues of different embryonal origin, on to the different pH of dermoid cysts resulting from the presence of abundant sebum.¹⁰ However, in the present report normal enamel, cement and pulpal tissue were observed except calcospherite structure on the surface of dentin.

As a result, we assumed that the findings of this study and further studies on this topic would be extremely useful in tissue and organ engineering studies.

However, it seems that the investigation of growth factors and further analysis in the development of tooth which grow in different areas is mandatory.

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