CASE REPORT

Case Report: A Primordial odontogenic tumor [version 1; peer review: 4 approved]

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Abstract

Introduction: Primordial odontogenic tumors are a rare recently described mixed odontogenic tumor composed histopathologically of dental papilla like tissue and enamel organ like tissue. Only nine cases have been documented worldwide and we are reporting the tenth case which is from Egypt.

Clinical finding: A 2-year-old Egyptian boy that presented with an asymptomatic swelling of the mandible which appeared with multilocular radiolucency associated with an impacted developing tooth on a computerized tomography (CT) scan.

Diagnoses, interventions, and outcomes: The lesion was excised and diagnosed as a primordial odontogenic tumor. The patient was followed up for two years with no recurrence.

Conclusion: Differentiation of primordial odontogenic tumors from other odontogenic tumors, which resemble it histopathologically is crucial to avoid unnecessary aggressive treatment.

Keywords
Primordial, Mixed odontogenic tumor, Jaw tumor, Odontogenic.

Open Peer Review

Reviewer Status ✓ ✓ ✓ ✓

Invited Reviewers

<table>
<thead>
<tr>
<th>Number</th>
<th>Name</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Eman Abdelzaher</td>
<td>Alexandria University, Alexandria, Egypt</td>
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<td>2</td>
<td>Marwa Mokbel ElShafei</td>
<td>Misr International University (MIU), Cairo, Egypt</td>
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<tr>
<td>3</td>
<td>Eman A. Abo Hager</td>
<td>Al-Azhar University, Cairo, Egypt</td>
</tr>
<tr>
<td>4</td>
<td>Manal Al-Hajri</td>
<td>Sana’a University, Sana’a, Yemen</td>
</tr>
</tbody>
</table>

Any reports and responses or comments on the article can be found at the end of the article.
Introduction

Primordial odontogenic tumor (POT) is a recently described mixed odontogenic tumor described in the last WHO classification of head and neck tumors. This tumor has been described as other entities in the past, because of its histological similarity to other odontogenic tumors such as ameloblastic fibroma, odontogenic myxoma, and odontogenic fibroma and hyperplastic dental follicles.

Mosqueda-Taylor et al. described and denominated this novel lesion which did not fulfill the criteria of any of the previously classified odontogenic tumors by reporting the clinicopathological and immunohistochemical features of six cases diagnosed as primordial odontogenic tumor.

Primordial odontogenic tumors are characterized histologically by a variably cellular loose fibrous tissue with areas similar to the dental papilla, covered by cuboidal to columnar epithelium that resembles the internal epithelium of the enamel organ, surrounded at least partly by a delicate fibrous capsule.

Only nine cases have currently been reported, and we report an additional case of an primordial odontogenic tumor from Egypt.

Case report

A 2-years-old Egyptian boy referred to Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Cairo University in November 2015 with a fleshy swelling arising from site of marsupialization performed two months previous. By taking patient's history we established the lesion arose as a painful swelling covered with normal mucosa causing obliteration of the vestibule with two months duration. Manual examinations of the regional lymph nodes were negative on examination. By computerized tomography (CT) scan, a multilocular radiolucent lesion was seen associated with an impacted developing tooth in the mandibular posterior area measuring 3cm × 4cm (Figure 1).

On aspiration, straw cystic fluid was noted. Complete surgical excision of the lesion with the impacted tooth was performed. And the excised lesion was sent to the Department of Oral and Maxillofacial Pathology, Faculty of Dentistry, Cairo University. The gross specimen showed a cystic lesion which showed areas of thickening. Hematoxylin and eosin stained sections revealed surface columnar and cuboidal epithelium covering a loose and myxoid fibrous tissue (Figure 2) and this specimen was diagnosed as a primordial odontogenic tumor. The patient was followed up for two years with no recurrence, and new bone formation was detected in the follow up radiographs (Figure 3).

Discussion

POT is a new entity first reported in a case series of 6 cases in 2014 described as benign mixed odontogenic tumor by Mosqueda-Taylor et al. Then another two cases were reported in 2015 and 2017 by Slater et al. and Ando et al. respectively then in 2018 Bajpai and Pardhe described another case. This novel lesion was added to the new WHO classification of odontogenic tumors.

Figure 1. Preoperative computerized tomography scan revealed an osteolytic multilocular radiolucency at posterior mandible associated with an impacted developing tooth.
Table 1 shows the clinicopathological and radiographic data of the nine documented cases. All reported patients were of young age group, ranging from 3–19 years with almost equal sex predilection and with posterior mandible as predominate site. All of these clinical finding are similar to this reported case.

All reported lesions were expansile and asymptomatic which are opposite to our case as it was painful during presentation, which may be the result of the previous marsupialization.

Radiographically, POT presents with a well-defined radiolucent lesion, either unilocular or bilocular, except in the case of Bajpai and Pardeh who reported a case that appeared multilocular.

All documented cases shared similar histopathological criteria proposed by Mosqueda-Taylor et al., as did our present case, where loose and myxoid connective tissue stroma resembles the dental papilla covered by columnar epithelium of a single layer, with the epithelium resembling the inner enamel epithelium.

Regarding the treatment approach, all previously documented lesions were treated with enucleation with different periods of follow up and reported no recurrence, in line with our presented case.

In conclusion, this is the first report case of POT from Egypt after it was defined in the latest WHO classification. Differentiation between POT and other closely resembling odontogenic...
Table 1. Clinicopathological and radiographic data of the nine documented cases of primordial odontogenic tumor. M: Male; F: Female; RL: Radiolucent; UL: Unilocular; ML: Multilocular; mm: millimeter.

<table>
<thead>
<tr>
<th>Study</th>
<th>Age (years)</th>
<th>Gender</th>
<th>Site</th>
<th>Clinical Picture</th>
<th>Radiographic Picture</th>
<th>Treatment and Follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mosqueda-Taylor et al.³</td>
<td>3</td>
<td>18</td>
<td>mandible</td>
<td>Asymptomatic buccal swelling</td>
<td>RL, UL, well defined, 45 × 40 mm</td>
<td>Enucleation, 20 years, uneventful</td>
</tr>
<tr>
<td>Mosqueda-Taylor et al.³</td>
<td>16</td>
<td>M</td>
<td>mandible</td>
<td>Asymptomatic, buccal and inferior mandibular cortical bone expansion.</td>
<td>RL, UL, well defined, 55 × 50 mm</td>
<td>Lost to follow-up</td>
</tr>
<tr>
<td>Mosqueda-Taylor et al.³</td>
<td>16</td>
<td>M</td>
<td>mandible</td>
<td>Asymptomatic buccal swelling</td>
<td>RL, UL, well defined, 65 × 50 mm</td>
<td>Enucleation, 10 years, uneventful</td>
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<tr>
<td>Mosqueda-Taylor et al.³</td>
<td>3</td>
<td>F</td>
<td>mandible</td>
<td>Asymptomatic buccal and lingual bone expansion.</td>
<td>RL, biloculated, well defined, 90 × 70 mm</td>
<td>Enucleation, 9 years, uneventful</td>
</tr>
<tr>
<td>Mosqueda-Taylor et al.³</td>
<td>13</td>
<td>F</td>
<td>mandible</td>
<td>Asymptomatic buccal swelling</td>
<td>RL, biloculated, well defined, 80 × 50 mm</td>
<td>Enucleation, 3 years, uneventful</td>
</tr>
<tr>
<td>Mosqueda-Taylor et al.³</td>
<td>3</td>
<td>F</td>
<td>maxilla</td>
<td>Asymptomatic buccal and palatal bone swelling.</td>
<td>RL, UL, well defined, 35 × 30 mm</td>
<td>Enucleation, 6 months, uneventful</td>
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<tr>
<td>Slater et al.⁴</td>
<td>19</td>
<td>M</td>
<td>mandible</td>
<td>Asymptomatic buccal and lingual bone swelling</td>
<td>RL, UL, well defined, 25 × 19 mm</td>
<td>Enucleation, 6 months, uneventful</td>
</tr>
<tr>
<td>Ando et al.⁵</td>
<td>8</td>
<td>F</td>
<td>maxilla</td>
<td>Asymptomatic, buccal swelling</td>
<td>RL, UL, well-defined, 16 × 15 mm</td>
<td>Enucleation, 7 months uneventful</td>
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<tr>
<td>Bajpai and Pardhe⁶</td>
<td>17</td>
<td>M</td>
<td>mandible</td>
<td>Asymptomatic buccal swelling</td>
<td>RL, ML, well defined, 30 × 20 mm</td>
<td>Enucleation, 6 months, uneventful</td>
</tr>
</tbody>
</table>

Consent
Written informed consent for publication of clinical details and images was obtained from the patient’s parent.

Data availability
Dataset 1: Raw histological image. A photomicrograph of Hematoxylin and eosin (H&E) stained sections showing primitive connective tissue stroma covered by columnar epithelium, (×200). 10.5256/f1000research.14735.d202214

Competing interests
No competing interests were disclosed.

Grant information
The author(s) declared that no grants were involved in supporting this work.

References
Open Peer Review

Current Peer Review Status: ✔️ ✔️ ✔️ ✔️

Version 1

Reviewer Report 12 July 2018

https://doi.org/10.5256/f1000research.16032.r34184

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Manal Al-Hajri
Oral Medicine, Oral Diagnosis and Periodontology Department, Sana'a University, Sana'a, Yemen

The case report article provides a good idea about POT especially because they are rare tumors and only a few cases have been reported. Article also writes all diagnosis methods and treatment outcomes and compared all cases of POT. Follow up of cases, I think, need a longer period than two years to decide no recurrence.

References

Is the background of the case’s history and progression described in sufficient detail?
Yes

Are enough details provided of any physical examination and diagnostic tests, treatment given and outcomes?
Yes

Is sufficient discussion included of the importance of the findings and their relevance to future understanding of disease processes, diagnosis or treatment?
Yes

Is the case presented with sufficient detail to be useful for other practitioners?
Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: oral medicine and periodontology
I have read this submission. I believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Author Response 08 Aug 2018

Layla Hafed, Cairo University, Cairo, Egypt

Sure doctor, two years of followup are not enough to decide no recurrence. For that the patient is still under followup for the third year and there is no recurrence.

Competing Interests: No competing interests were disclosed.

Author Response 09 Aug 2018

Layla Hafed, Cairo University, Cairo, Egypt

Thank you doctor for your approval.

Competing Interests: No competing interests were disclosed.

Reviewer Report 05 June 2018

https://doi.org/10.5256/f1000research.16032.r34183

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Eman A. Abo Hager
Oral and Dental patholology, Faculty of Dental Medicine, Al-Azhar University, Cairo, Egypt

This is an interesting case report describing in a full details a rare recently described mixed odontogenic tumor. I would prefer the authors to suggest further diagnostic test to differentiate pemordial odontogenic tumor from the aggressive odontogenic myxomas especially when cases unexpectedly appear radiographically multilocular radiolucent as in the present case.

Is the background of the case's history and progression described in sufficient detail?
Yes

Are enough details provided of any physical examination and diagnostic tests, treatment given and outcomes?
Yes

Is sufficient discussion included of the importance of the findings and their relevance to future understanding of disease processes, diagnosis or treatment?
Yes
Is the case presented with sufficient detail to be useful for other practitioners?  
Yes

**Competing Interests:** No competing interests were disclosed.

**Reviewer Expertise:** Oral and dental pathology

I have read this submission. I believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

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**Author Response 08 Aug 2018**

**Layla Hafed, Cairo University, Cairo, Egypt**

A panel of epithelial and mesenchymal IHC markers could be done but they are of no valuable diagnostic benefits as recorded by previous studies. Careful H & E sections examination is enough, the present of columnar epithelium covering the primitive connective tissue stroma could differentiate the POT from the odontogenic myxoma which lacks the covering.

**Competing Interests:** No competing interests were disclosed.

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**Reviewer Report 05 June 2018**

https://doi.org/10.5256/f1000research.16032.r34185

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**Marwa Mokbel ElShafei**

Oral Pathology, Misr International University (MIU) , Cairo, Egypt

The case report presented here is a well constructed case, the rarity and novelty of the lesion makes it useful for the clinicians and indeed, as stated, it may lead to a more conservative treatment and save the patient an aggressive treatment.  
The young age of the patient is interesting and gives a probable reassurance for the parents as only a conservative treatment is needed.  
A clinical picture for the patient would have been useful if present and also a clinical picture after full recovery.  
A need to switch the magnification on the histopathologic pictures is to be done.

Is the background of the case's history and progression described in sufficient detail?  
Yes

Are enough details provided of any physical examination and diagnostic tests, treatment given and outcomes?  
Yes
Is sufficient discussion included of the importance of the findings and their relevance to future understanding of disease processes, diagnosis or treatment?
Yes

Is the case presented with sufficient detail to be useful for other practitioners?
Yes

**Competing Interests:** No competing interests were disclosed.

I have read this submission. I believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

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**Author Response 10 Aug 2018**

Layla Hafed, Cairo University, Cairo, Egypt

Thank you doctor for your approval. Unfortunately, the surgeon did not take photos for the patient. And about the numbers on the histopathologic pictures those are the measure of the microscope scale bar not the magnification.

**Competing Interests:** No competing interests were disclosed.

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**Reviewer Report 23 May 2018**

https://doi.org/10.5256/f1000research.16032.r34186

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Eman Abdelzaher

Department of Pathology, Faculty of Medicine, Alexandria University, Alexandria, Egypt

This is a well-written case report describing a rare entity which was recently described. I would encourage the authors to add more histopathological details and elaborate on the discussion section mainly focusing on important differentiating points with histopathological mimics.

Please click [here](https://doi.org/10.5256/f1000research.16032.r34186) for the annotated PDF of this article.

Is the background of the case's history and progression described in sufficient detail?
Yes

Are enough details provided of any physical examination and diagnostic tests, treatment given and outcomes?
Yes
Is sufficient discussion included of the importance of the findings and their relevance to future understanding of disease processes, diagnosis or treatment?
Yes

Is the case presented with sufficient detail to be useful for other practitioners?
Yes

**Competing Interests:** No competing interests were disclosed.

**Reviewer Expertise:** Neuropathology, Surgical Pathology

I have read this submission. I believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

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Author Response 10 Aug 2018

**Layla Hafed,** Cairo University, Cairo, Egypt

Thank you doctor for your approval. We mentioned all the histopathological criteria that were reported in the last WHO classification of head and neck tumors which are pathognomonic for POT where the columnar epithelium covering the primitive connective tissue stroma could not be seen in any other histopathological mimics.

**Competing Interests:** No competing interests were disclosed.

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