Delayed eruption: The importance of early recognition

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ABSTRACT

Introduction: There are many possible causes for delayed tooth eruption. A dental professional needs to recognize when to investigate further and/or refer for specialist assessment, since early diagnosis and intervention will improve patient outcomes. In the current litigious climate, dental professionals must also be vigilant to avoid claims of clinical negligence. Case Report: The case presented is that of a 19-year-old male with dentigerous cysts (DCs) associated with all four unerupted third molars. The mandibular cysts also involved the second molars, in which failure of eruption was not investigated at a younger age. This delay is likely to have led to the need for more extensive surgery which carried a greater risk of complications. Conclusion: It is important for a dental professional in primary care to recognize delayed eruption and investigate further with appropriate radiographs. Prompt referral for specialist opinion, as with any clinical anomaly, improves patient outcomes and reduces the risk of litigation.

Keywords: Delayed referral, Medicolegal, Odontoegenic cyst, Oral surgery

INTRODUCTION

Teeth can fail to erupt for many reasons, including primary failure of eruption, single tooth ankylosis, or mechanical obstruction [1, 2]. One such mechanical obstruction is the formation of a DC associated with an unerupted tooth. Dentigerous cyst is the most frequently occurring type of developmental cysts in the jaw, accounting for 24% of cases [3]. It has a male predilection and typically occurs in the second and third decades of life [4–6]. The etiology of DC is thought to involve a build-up of fluid between the reduced enamel epithelium and the tooth crown within the follicle [7, 8].

Cases presenting with multiple DCs are usually linked to syndromic conditions, such as Mucopolysaccharidosis type VI (Maroteaux-Lamy), Cleidocranial dysplasia, Gorlin–Goltz and Gardner syndrome [4, 9]. Multiple DCs have also been linked to prolonged use of Cyclosporine A and calcium channel blockers [5, 10, 11]. In absence of these disorders and drug history, multiple DCs are rare [4, 7].

This report involves a case of a fit and healthy male patient who presented with DCs in all four quadrants causing delayed eruption of both lower second molars, and all four third molar teeth. It demonstrates how early identification of delayed eruption could have not only limited the amount of surgery he subsequently required but also reduced the potential risks and complications associated. In addition, screening for systemic conditions needs to be considered at presentation to allow medical management, which could lead to a better overall outcome for the patient.

The NHS Litigation Authority reported a 520.3 million pound increase in negligence payments in the last year [12]. The Dental Law Partnership has seen an increase in complaints by 25–30% year on year [13]. Many recent publications refer to “blame culture” and “defensive dentistry,” due to the rise of litigation within health care
[14, 15]. As clinicians it is important to holistic in patient management and ensure prompt and appropriate referral to avoid delay in treatment.

CASE REPORT

A 19-year-old male was referred to the Oral and Maxillofacial department at Gloucestershire Royal Hospital by his orthodontist regarding bilateral unilocular radiolucencies on a recent orthopantomogram (OPG) in all four quadrants (Figure 1). He presented with an unerupted lower right second molar (LR2M) and partially erupted lower left second molar (LL2M). He had consulted the same dentist since the age of 10, but had recently moved to a different area and registered with a new practice who prompted his referral. His OPG taken aged 10 years (Figure 2) was available and showed the presence of unerupted all four third molars and all four second molars. There were no signs of cystic changes of the dental follicles.

At his initial assessment in February 2017, the patient complained of no symptoms. He had no functional impairment from the delayed eruption of LR2M and LL2M. A thorough medical history was taken which revealed only mild seasonal asthma and a hypersensitivity to penicillin. There was an absence of systemic symptoms; no gastrointestinal signs suspicious of Gardner’s syndrome. The patient’s facial features were normal with no hypertelorism or frontal bossing and he was of average height and weight. He took no regular medication, was a nonsmoker and occasionally consumed alcohol. There was no known family history. Syndromic causes were therefore discounted.

The OPG from 2017 (Figure 1) showed a large unilocular, radiolucent lesion of the right angle of the mandible in the region of the lower right third molar (LR3M) and the LR2M. The LR2M also appeared to be in close proximity of the inferior alveolar nerve (IAN), with narrowing of the root and nerve canal. The lower left third molar (LL3M) and both upper third molars (UR3M, UL3M) also showed associated radiolucent areas with a cystic appearance.

On clinical examination, no mobility of the lower first molars or the partially erupted LL2M was noted. The LR2M was not visible or palpable. All other permanent teeth were in occlusion with normal morphology. His soft tissue examination was normal and there were no changes to the hard tissue structures in his mouth.

A computed tomography (CT) scan was requested to further assess the lesions associated with all four third molar teeth, and the proximity of the lower second and third molars in relation to the IAN. The CT scan showed LR2M roots were intimately associated with the IAN, causing narrowing of the nerve and its canal. The roots of LR3M were lying above the IAN canal.

The patient underwent staged enucleation of all four cysts, surgical removal of all four third molars and coronectomy of LR2M over two general anesthetic episodes. Histolopathological examination revealed loose fibrous tissue with some myxoid areas. Odontogenic epithelial rests and some reduced enamel epithelium were both present for all lesions. The pathology report concluded that all four abnormalities were compatible with DCs.

Six weeks following his second procedure, the patient reported paresthesia of his right lingual nerve which subsided by the time of his three month review. At 12 months, the intentionally retained root portion of the LR2M appeared to have started to migrate away from the IAN. He had no ongoing symptoms at this point (Figure 3). The patient was reviewed at 24 months to ensure no recurrence of the cysts. The OPG (Figure 4) demonstrated bony healing in all four quadrants, including around the retained roots of the LR2M, and no evidence of recurrence. The patient was then discharged.

Figure 1: Orthodontist orthopantomogram (2017). All four third molars present with cystic changes of their dental follicles and displacement LR2M and LL2M in a disto-angular direction.

Figure 2: Orthopantomogram (2009). All four third molars, all second molars, and upper canines unerupted but present with no evidence of cystic change.

Figure 3: Postoperative orthopantomogram (2018). LR2M roots in situ, all four third molars removed and cysts enucleated.
DISCUSSION

The Clinical Negligence Scheme for Trusts has seen claims relating to delayed referrals and delay in treatment, increased three fold in the last 10 years [16]. The total cost of settling these claims rose from £73,116 in 2007 to £2,920,236 just 10 years later [16]. Clearly, litigation within dentistry has not only become more common, but also more costly.

Primary failure of eruption is a rare condition that most commonly affects molar teeth [17] and its etiology is thought to be largely genetic. The most likely cause for failure to erupt is mechanical which encompasses DCs and other forms of odontogenic cysts, crowding, and impaction of teeth [2]. Conditions affecting craniofacial morphology and dental anomalies, such as root deflections and invaginations, have been linked to failure of eruption of second molar teeth [18]. The eruption of the second molar tooth occurs between 11 and 13 years of age [19]. Congenitally absent second molars are rare (0–3.4%) [20]. A failure of this tooth to erupt is an indication for radiographic investigation to ascertain if the tooth is absent or, more likely, has associated pathology [21]. In this case, the failure of the second molars to erupt may have been due to the position of the third molars, or due to the DCs themselves.

The patient’s OPG revealed pathology associated with both lower second molars and all four third molar teeth. Dentigerous cysts present radiographically as a well-defined unilocular radiolucency and are continuous with the cemento-enamel junction of the affected tooth [4, 5, 9]. However, other cystic lesions such as keratocystic odontogenic tumors (Kcotts) can mimic the appearance of DCs [22]. The cyst in the lower right quadrant was suspicious of a KCOT and thus was treated first.

Dentigerous cysts have the potential to develop into more aggressive lesions such as ameloblastomas or occasionally squamous cell carcinomas [23, 24]. Hence, early diagnosis can significantly impact patient outcomes in diagnosis and complications [24]. In addition, multiple DCs are often associated with systemic causes, such as Mucopolysaccharidosis type VI (Maroteaux-Lamy), Cleidocranial dysplasia, Gorlin–Goltz and Gardner syndrome [4, 9]. Fortunately, this patient had no signs or symptoms relating to any of these systemic conditions, but was fully assessed by his medical practitioner at our request. Due to the delay, the patient may well have had a systemic cause that could have been missed, but this is unlikely not to have been picked up before.

This case was treated with enucleation and extraction of all four third molars and coronectomy of the lower right second molar (LR2M) which was involved in the DC; other options include decompression and marsupialization [25]. A CT scan indicated a low risk of damage to the IAN with regard to the third molars; however, the LR2M was intimately associated with the IAN. Accordingly, LR2M was treated with a coronectomy as opposed to an extraction. Coronectomy is well known to reduce the risk of IAN damage when roots are in an intimate relationship with the IAN and has been shown to be effective for treatment of DCs [2]. However, the procedure does carry an increased risk of further surgical treatment if postoperative complications occur [2, 26, 27].

The initial appearance of the L2Ms and L3Ms on his OPG (Figure 2), taken aged 10, could have led the dentist to be suspicious of the risk of mechanical obstruction posed by the third molars. This may have led them to have undertaken radiographic assessment, perhaps on a yearly basis. Early acknowledgement of a potential problem with eruption should have initiated a referral to an orthodontist for assessment and treatment planning. The absence of the eruption of teeth, excluding third molars, is an indication for orthodontic referral under NHS guidelines [28]. This includes cases of hypodontia, impactions, and unerupted teeth [28]. The L3Ms could subsequently have been removed prior to completion of root formation to allow the L2Ms to erupt, therefore negating the risk to the IAN. Cyst enucleation would most likely have been less invasive, and in fact the DCs may never have formed.

The General Dental Council receives more complaints from patients year-on-year [29]. Cases of failing to diagnose carry and periodontal diseases have started to appear in fitness to practice hearings over the last few years [30]. Recent cases show that penalties for missing basic dental disease include sanctions being placed on dentists and even periods of suspension [30]. The number of cases pertaining to delayed referral, which have been settled by defense unions, hence avoiding referral to the General Dental Council, is unknown. On contacting defense unions for these figures the authors were informed that disclosure of these data were prohibited as they may be misrepresented. It is the duty of dental professionals to monitor, investigate, and refer when knowledge or management of a condition is outside of the remit of their personal practice [31].

CONCLUSION

This rare case highlights some important points. From a medicolegal point of view, it is the responsibility...
of a general dental practitioner to monitor eruption of permanent teeth and ascertain when radiographic assessment and referral is required. Delay in diagnosis of missing teeth, possible associated pathology, and systemic conditions can result increased patient morbidity and the requirement of more surgical input and associated complications. Prompt referral is vital, particularly in the current climate, dental practitioners must be diligent and seek specialist advice quickly to avoid scrutiny and possible litigation.

REFERENCES

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