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FRACTURED POSTERIOR PRIMARY TOOTH ROOT DUE TO STRESS FROM A TOOTH-COLORED RADIOLUCENT RESTORATION MIMICKING CARIES IN AN IOPA – A CASE REPORT

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ABSTRACT

The resilient bones supporting the primary dentition often results in a dental displacement rather than damage to the hard tissues. The root fractures are seldom observed in posterior teeth of this dentition. Fractured teeth treatment results in complications during final restoration. The aim of the present report was to describe the diagnosis, treatment, and a 4-week follow-up of an unusual case of uncomplicated root fracture in a upper first primary molar with a fracture line that is often difficult to diagnose in a 6-year-old boy caused by stress induced occlusal trauma from a tooth coloured restorative dental material.

KEYWORDS

Radiolucent dental material, Radio-opaque dental material, Fractured root, Primary tooth and Primary tooth obturation.

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INTRODUCTION

The trauma to the primary dentition is usually confined to the supporting structures Andreassen and Andreassen, 1994 but the statement was contradicted by Holan in 1997 that it may apply to the primary incisors and not molars. However, multiple roots and greater root surface reduce the possibility of severe damage to the periodontal ligament when compared with incisors. It is well-known that an impact on the resilient bones supporting the primary dentition often results in a dental displacement rather than damage to the hard tissues Bennet, 1963[1]. Therefore, crown

and crown-root fractures are uncommon in the primary dentition Andreassen and Andreassen, 1994. According to some authors Needleman and Wolfman, 1976, Morisaki *et al*, 1989 posterior tooth fractures may not be detected in an emergency examination after the accident, but only be diagnosed later, when the patient begins to complain of pain[1,2].

Regarding the treatment of crown-root fractures in primary teeth, the extraction of the involved teeth is generally chosen Needleman and Wolfman, 1976, Morisaki *et al*, 1989, Andreassen and Andreassen, 1994[2].

The relative radiopacity of restorative materials is an important auxiliary to diagnose secondary caries, detect excess restorative material on the cervical margins of proximal surfaces, determine the proximal contour of the restoration as well as its contacts with adjacent teeth[3,4], and, also, to distinguish restorative material from gaps or voids[5,6]. The use of less radiopaque materials than dentin as a base under restorative materials could be radiographically mistaken for decalcified or carious dentin. Radiopacity allows a proper constrast between enamel/dentin and restorative material, improving the radiographic diagnosis of recurrent caries, faulty proximal contour, and marginal adaptation[7].

Crown-root fractures in the primary molars are the most rare type of such injuries, and these generally result as a consequence of indirect trauma[8]. The following case primary tooth root fracture is one such example caused by the concentrated stress forces by the radiolucent tooth-colored restorative material. According to literature, natural teeth are the ideal space maintainers Duggal *et al*, 1995. In addition parents were willing to save the teeth. Thus, in the present case, despite the fracture in the distal root of primary molar, pulpectomy was carried out followed by restoration with a preformed metal crown, rather than extraction.

Case report

A 5 yr old boy reported to our clinical set-up with a cheif complaint of pain in upper left back teeth region since 2 days. On interviewing the parents, there was non-contributory medical history but dental history revealed that few restorations were done in their Asian native country 2 months back.

Clinical findings

On examination, there were tooth coloured resin dental material restorations on tooth 64, 74, 75 and 84, quite difficult to identify or diagnose from that of a healthy normal tooth structure.

Radiographical findings

A radiolucent lesion mimicking dental caries was noticed in IOPA w.r.t tooth 64 along with an unusual, uncomplicated horizontal fracture at apical-third of the distal root of the tooth 64. Along with secondary caries communicating with pulpal tissues of tooth 64, alveolar bone changes were also noticed in the furcation area, indicating the tooth for pulp therapy. The adjacent 65 showed occlusal pit caries (Figure No.1).

Treatment and Follow-Up

It was decided to go ahead and stabilise the fracture with pulpectomy w.r.t 64 followed by stainless steel crown despite the fracture of the distal root in the apical third as the prognosis is good. The adjacent 65 was explored and a temporary restoration was given and further evaluated (Figure No.2). After a 4 week follow-up was done both radiographically and clinically and success of the treatment was acknowledged. The patient is asymptomatic until now and is still under review.

DISCUSSION

Different patterns of fracture lines have been observed for both simple and multiple lines of fracture in the crown. Simple lines of fracture predominate in the root because, when the tension zone is concentrated at the crown, the root does not suffer the greatest impact[1]. Due to the limitations in the two-dimensional images achieved by radiographic examinations, this different pattern is difficult to diagnose. The fundamental requirements of the prognosis of traumatized primary teeth, a professional expertise along with well-conducted treatment, and most importantly the long-term follow-ups[2].

The evaluation of the proximal contours of the restoration and their contacts with adjacent teeth can also be evaluated with radiographs. Thus, it is

recommended that restorative materials be radiopaque[3,4]. However, radiopacity cannot be excessive, or it will obscure caries adjacent to a restoration[9]. Hence, materials with a moderate degree of radiopacity are preferable to those with a high degree of radiopacity[10].

The addition of elements such strontium, barium, and lanthanum, the fusing of silver to the glass, or even the mixing of zinc oxide, or zirconium oxide to glass-ionomer materials can make them radiopaque[10,11]. The presence or absence of these elements seems to be responsible either for the radiopacity or the radiolucency of the restorative materials studied.

Non-metallic restorations may vary in appearance from radiolucent to slightly radioopaque, depending on the density of the material. The most dense and least radiolucent amongst dental material is porcelain, and acrylic the least dense and most radiolucent.

Radio-opaque materials

Structure with higher object density such as amalgam, gold, silver points, pins, gutta percha, porcelain.

Radiolucent materials

Structure with lower object density such as older composites and dentin bonding agents. Restorative materials which mimic dental caries are older calcium hydroxide liner without barium zinc or lead, Composites, Polymethyl methacrylate, Silicate, Porcelain. To make the restoration more opaque when viewed on radiograph materials such as lithium, barium or strontium are added to the filler. Older materials did not have these fillers and appear most radiolucent.

The success of treatment is influenced by various factors such as the severity of trauma, stage of root formation, time elapsed since the trauma, and adverse issues regarding the application of the techniques[11].

Figure No.1: Pre-op IOPA

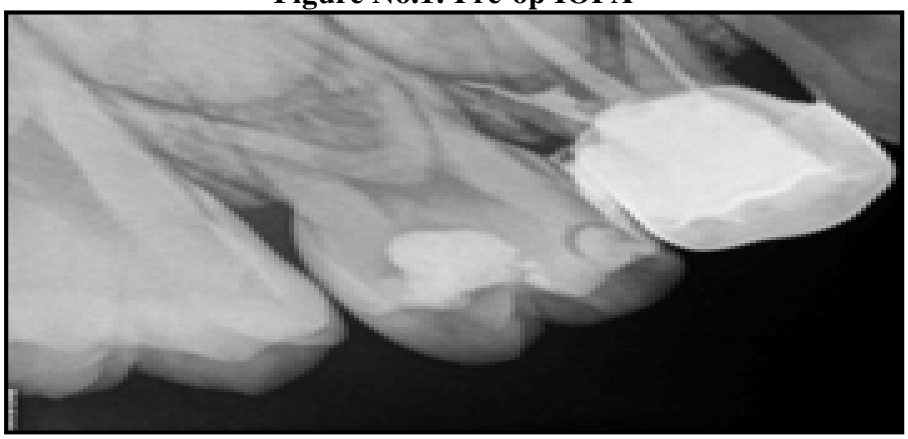

Figure No.2: Post-op IOPA

CONCLUSION

This case highlights the importance of radiographic examination also demonstrates that conservative management is possible and not all posterior primary teeth with crown-root fractures need to be extracted. It is possible to identify and differentiate these restorative materials from caries by their well-defined and smooth outline reflecting the preparation or from their radio-opaque liners. While treating the traumatized teeth it has to be kept in mind that the treatment approach should respect the dental and periodontal structures involved. The operating clinical dentist should be able to chart out effective therapeutic measures that provide the best possible prognosis.

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CONFLICT OF INTEREST

We declare that we have no conflict of interest.

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