Case Report
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Condylar fracture associated with trauma in early childhood: case report

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Abstract: Facial fractures are challenging situations with an estimated prevalence of around 1% to 6% in early childhood. When facial trauma occurs, involvement of mandibular structures such as the condyle is highly prevalent. The present study aimed to report a case of condylar fracture associated with trauma in early childhood, including the diagnosis and management. A 6-year-old female patient presented to the Pediatric Dental Emergency Care at the Children's Specialty Clinic, Baby-Clinic, at the State University of Londrina (UEL), with a complaint of prolonged retention of tooth 51 and the need for orthodontic treatment. During the anamnesis, the legal guardian reported providing preventive dental care at the Basic Health Unit and a history of trauma at 3 and 6 months of age. On clinical examination, facial asymmetry and deviation of the midline during mouth opening were observed. Palpation revealed inadequate movement of the left temporomandibular joint. Complementary exams confirmed the diagnosis of condylar fracture and consolidation of the left condyle in an abnormal position. As a course of action, the multidisciplinary team opted to follow the case until the jawbone had fully developed. Based on this report, we can conclude that it is the pediatric dentist's duty to be alert to skeletal changes in children to avoid underdiagnosis of severe bone fractures and their sequelae, ensuring quality of life for the child and his/her family.

Keywords: Jaw Fractures, Mandibular Condyle, Pediatric Dentistry.

Fratura condilar associada à trauma na primeira infância: relato de caso

Resumo: Fraturas faciais são situações desafiadoras com uma prevalência estimada em 1% a 6% na primeira infância. Quando da ocorrência de um traumatismo facial, o envolvimento de estruturas mandibulares como o côndilo é altamente prevalente. O presente estudo teve como objetivo relatar um caso de fratura condilar associada à trauma na primeira infância, o diagnóstico e a conduta. Paciente do sexo feminino, 6 anos de idade, compareceu ao Pronto Atendimento Odontológico Infantil da Clínica de Especialidades Infantis, Bebê Clínica, da Universidade Estadual de Londrina (UEL) com queixa de retenção prolongada do dente 51 e tratamento ortodôntico. Durante a anamnese, a responsável legal relatou realizar atendimento odontológico preventivo na Unidade Básica de Saúde e histórico de trauma aos 3 e 6 meses de vida. Ao exame clínico, observou-se assimetria facial e desvio de linha média durante abertura bucal. Ao exame de palpação, constatou-se movimentação inadequada da articulação temporomandibular esquerda. Exames complementares confirmaram o diagnóstico de fratura condilar e consolidação do côndilo esquerdo em posição anômala. Como conduta, a equipe multidisciplinar optou pela proservação do caso até o desenvolvimento ósseo completo da mandíbula. Com base neste relato, podemos concluir que é dever do odontopediatra estar atento à alterações esqueléticas em crianças a fim de evitar o subdiagnóstico de fraturas ósseas severas e suas sequelas, garantindo qualidade de vida à criança e sua família.

Palavras-chave: Côndilo Mandibular, Fraturas Maxilomandibulares, Odontopediatria.

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Fractura del cóndilo asociada a traumatismo en la primera infancia: reporte de caso

Resumen: Las fracturas faciales son situaciones desafiantes con prevalencia estimada alrededor de 1% a 6% en la primera infancia. Cuando ocurre un traumatismo facial, la implicación de estructuras mandibulares como el cóndilo es altamente prevalente. El presente estudio tuvo como objetivo relatar un caso de fractura condilar asociada a trauma en la primera infancia, incluyendo el diagnóstico y la conducta. Una paciente de sexo femenino, de 6 años, acudió al Servicio de Urgencias Odontológicas Infantiles de la Clínica de Especialidades Infantiles, Bebé Clínica, de la Universidad Estatal de Londrina (UEL), con queja de retención prolongada del diente 51 y tratamiento ortodóntico. Durante la anamnesis, la responsable legal informó que se realizaba atención odontológica preventiva en la Unidad Básica de Salud y un historial de trauma a los 3 y 6 meses de vida. Durante el examen clínico, se observó asimetría facial y desviación de la línea media durante la apertura bucal. La palpación reveló un movimiento inadecuado de la articulación temporomandibular izquierda. Los exámenes complementarios confirmaron el diagnóstico de fractura condilar y consolidación del cóndilo izquierdo en una posición anómala. Como conducta, el equipo multidisciplinario optó por la observación del caso hasta el desarrollo óseo completo de la mandíbula. Con base en este relato, podemos concluir que es deber del odontopediatra estar atento a las alteraciones esqueléticas en los niños para evitar el subdiagnóstico de fracturas óseas severas y sus secuelas, garantizando la calidad de vida del niño y su familia.

Palabras-Clave: Cóndilo Mandibular, Fracturas Maxilomandibulares, Odontología Pediátrica.

Introduction

Episodes of facial fractures are uncommon in children, although they may require immediate medical attention and extensive intervention depending on the severity and seriousness of the injury.[1,2] Epidemiologically, the estimated prevalence of facial fractures in children under 6 years old is extremely low and can range from 1% to 6%.[3,4] Most studies suggest a trend of increasing fracture rates with advancing age.[3-5]

Regarding the location of these injuries, mandibular fractures (MF) represent frequently involved structures, accounting for 24% to 44%.[2,6] Additionally, involvement of injuries to the condyle is extensively reported and can be present in up to 72% of MF.[7-9]

The main etiological factors associated with MF include accidental falls, automobile accidents, assaults, and collisions.[1,2,10] With the imminent involvement of the stomatognathic system during a trauma episode, respiratory, phonetic, masticatory, and swallowing alterations may be associated. As a consequence, the functioning of the stomatognathic system is altered, leading to headaches, ear pain, and poor posture.[5,11] Specifically for the first months of life, difficulties in breastfeeding, impacts on quality of life, self-esteem, and the well-being of the child and the family unit are aspects that may be involved.

Considering the aforementioned aspects and the low prevalence of MF in early childhood, the objective of the present study was to report a case of condylar fracture associated with trauma in early childhood and to highlight the importance of early diagnosis and management.

Case report

A 6-year-old female caucasian patient, presented to the Pediatric Dental

Figure 1: *Facial appearance of the child at 3 months (A), 3 years (B), and 6 years of age (C).*

Emergency Care at the Children's Specialty Clinic, Baby Clinic, at the State University of Londrina (UEL), with a complaint of prolonged retention of tooth 51 and the need for orthodontic treatment. On extraoral clinical examination, facial asymmetry and altered mandibular dynamics during mouth opening and closing were observed. During the anamnesis, the legal guardian confirmed the presence of noticeable facial asymmetry even before the first year of age, along with a history of trauma at 3 and 6 months when the baby fell from the crib and the bed, respectively. Image records from the family's personal archive, from the child's birth to the current age, already evidenced facial asymmetry (Figures 1A, 1B, and 1C). Upon performing the palpation maneuver, the absence of left condylar movement during mouth opening and a deviation of the midline to the same side were observed. Clinically, a change in the position of the erupted lower teeth was observed (Figure 2). There was no report of painful symptoms at any stage of the child's life. Based on the clinical characteristics and palpation examination of the temporomandibular joints (TMJ), a more severe skeletal alteration was noted.

A panoramic radiograph (Figure 3), reverse Towne anteroposterior radiograph (Figure 4), and volumetric computed tomography were requested for the evaluation of the left TMJ. The tomographic examination revealed a malformed and/or fractured left mandibular condyle, consolidated in an abnormal position, tilted toward the anterior and medial regions, outside the articular cavity, with a shortened notch and neck of the mandibular head and an underdeveloped articular eminence of the left TMJ (Figure 5).

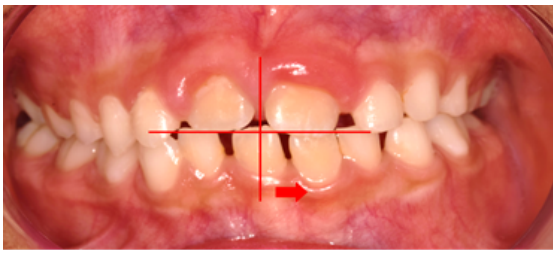

Figure 2. *Midline deviation to the left and alteration in the position of the lower teeth in the dental arch.*

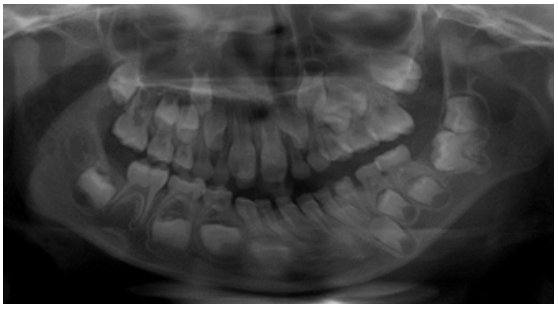

Figure 3. *Panoramic radiographic examination.*

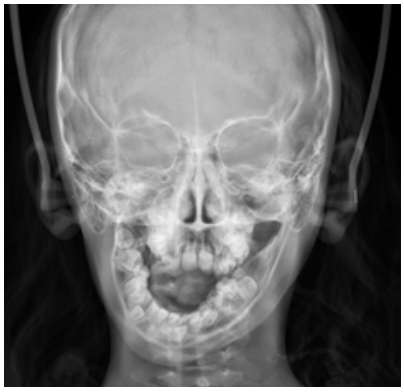

Figure 4. Reverse Towne posteroanterior radiographic examination

As a procedure, the multidisciplinary team (oral and maxillofacial surgeons, radiologists and pediatric dentists) proposed two treatment options to the family: 1) Orthopedic treatment with functional appliances; 2) Monitoring of the case due to preservation of the masticatory function, since the possibility of corrective surgery at this time could interfere with the child's quality of life. However, due to personal reasons of moving to another country in 30 days and the impossibility of attending appointments, the family was duly advised to seek another professional and was referred to an osteopath for strengthening of the adjacent structures involved in the movements of chewing, phonation and swallowing, in order to prevent ankylosis of the left TMJ.

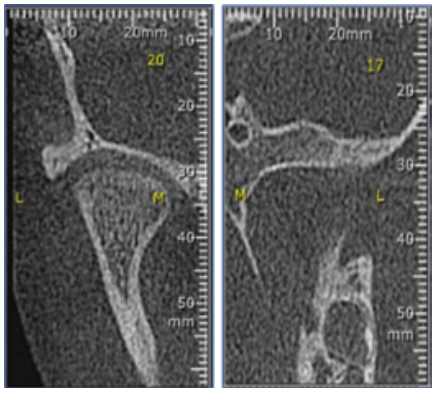

Figure 5. Cone beam computed tomography examination.

Discussion

Although dental-alveolar traumas are commonly encountered in early childhood, cases of condylar fractures are rare and more prevalent in adult patients. This fact can be attributed to the anatomical characteristics that protect facial structures and the greater care that a child patient receives from their guardians.[7,8,12] Moreover, most fractures arise from impact forces on the anterior part of the mandible and are transmitted to the condylar area.[13,14]

In the present study, it was reported that the child had suffered two episodes of trauma at 3 and 6 months of age due to accidental falls. The literature is controversial regarding the most prevalent cause, as some studies suggest that falls represent the most common etiological factor for facial trauma in infants and preschool-aged children[7,15], while others suggest a low prevalence in infants under 12 months.[12]

Regarding mandibular development, it is known that after birth, this structure undergoes various modifications due to growth stimuli from breastfeeding and masticatory movements. Physiological growth occurs downward and forward through mechanisms of bone deposition and resorption that allow for the establishment of normal occlusion patterns and masticatory force.[16] Even so, it is the last bone of the face to complete its development, which allows for greater

growth alterations when injured.[8,17] The stage of development of the mandibular bone determines the condylar response to trauma, as the condylar region in children is wider and more vascularized, leading to increased regenerative potential and remodeling capacity.[8,16,18] However, the increased vascularization makes it more susceptible to crushing injuries.[16,18]

The identification of facial asymmetry during the physical examination and the diagnosis of the condylar fracture with the aid of complementary exams were made only at 6 years of age by the Baby Clinic team, despite the patient receiving preventive dental care at the Basic Health Unit. In this regard, it is important to emphasize that healthcare professionals, specifically dentists, must be able and qualified to clinically identify alterations and asymmetries in order to minimize potential severe consequences. The identification of the alteration can be performed through mandibular dynamics exercises and professional knowledge, while the diagnosis requires the association of imaging exams. Condylar fractures in children can lead to complications such as pain, facial asymmetry, retrognathism, malocclusion, midline deviation during mouth opening, clicking in the TMJ, and ankylosis of the joint itself.[8,12]

Treatment of condylar fractures in children includes closed reduction (intermaxillary fixation), open reduction (surgical) and conservative treatment (physiotherapy and functional orthopedics). The conservative protocol is commonly used in pediatrics due to its good long-term results. The main objectives are to reduce the fractured segments, restore dental occlusion, control infection, promote bone remodeling, prevent mandibular deviation, reduce pain and prevent growth and temporomandibular joint problems.[19]

In the present clinical case, due to the circumstances presented, the patient did not undergo any dental treatment. It is important to understand and assume that the patient's immaturity and the risks associated with an extensive surgical procedure could lead to treatment failure. In view of this, monitoring and observation of cases of condylar fracture in children can be considered a favorable treatment option even with aesthetic and radiographic changes, since the mandible of a developing child provides a limited amount of bone for surgical procedures to reduce and fix fractures.[8,9] In addition, multidisciplinary monitoring between pediatric dentists, osteopaths, radiologists, physical therapists and oral and maxillofacial surgeons is essential due to the complexity of cases involving injuries with late diagnosis and treatment. In this case, the family was advised to seek a dentist and an osteopath to perform exercises to strengthen the structures involved until the appropriate time for surgical intervention, to avoid possible ankylosis of the joint and impairment of the opening and closing movements of the mouth. Osteopathy is a behavior that seeks to modify, alleviate or reduce habits or problems that cause a negative impact on the development and normal growth of the maxillofacial complex, correcting occlusal relationships through opening and tightening movements, as well as laterality.[19]

The assessment of pain in newborns and infants is difficult to measure since pain is a subjective phenomenon, and

the physical, cognitive, and behavioral development of the baby complicates the diagnosis of painful sensations.[20,21] In the 2000s, some authors argued that babies do not feel pain in the same way adults do,[22] Although recent studies show that babies are hypersensitive to painful stimuli due to the immaturity of their nervous system, perceiving pain in a manner very similar to that of adults.[21,22] In this study, the patient experienced two episodes of trauma during the first months of life, one of which was reported by the family as being accompanied by drowsiness and fainting. Despite this, no painful sensations were reported at any point in the child's life, possibly due to the lack of methods and studies on ideal techniques for assessing and measuring pain sensations in infants. Additionally, the mother did not report any episodes or difficulties with breastfeeding, which was performed until 20 months.

The perception of a slight asymmetry, even in early childhood, is of utmost importance for the correct intervention at the appropriate time in the child's life, allowing for functional development of the stomatognathic system. It is essential that families are properly informed about the potential consequences, even in cases of mild trauma. It is the primary duty of the pediatric dentist to conduct a detailed anamnesis and physical examination that goes beyond the family's complaint.

Conclusions

It is concluded that the diagnosis of conditional fracture is extremely important in preventing possible aesthetic and functional complications. In the case presented, the perception of a level of asymmetry, even in early childhood, is of utmost importance for the correct intervention at the appropriate time in the child's life, allowing the functional development of the stomatognathic system. It is essential that families are properly informed about the possible consequences, even in cases of mild trauma. It is the primary duty of the pediatric dentist to perform a detailed anamnesis and physical examination that go beyond the family's complaint.

Conflict of interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

Ethics statement

The authors declare that the parents gave consent for images and clinical information of the case to be reported in scientific publications. Parents understand that the child´s name and initials will not be published, and efforts will be made to conceal the child´s identity. This article complies with the protocols of the Research Ethics Committee of the State of University of Londrina.

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