World Bulletin of Public Health (WBPH)
Available Online at: https://www.scholarexpress.net
Volume-54 January 2026
ISSN: 2749-3644

FEATURES OF MANDIBULAR FRACTURES IN CHILDREN (ANALYTICAL LITERATURE REVIEW)

Ikramov Gayrat Alimovich
Cand. Sci. (Med.), Associate Professor
Department of Pediatric Surgical Dentistry,
Tashkent State Medical University,
Tashkent, Uzbekistan
Khalmanov Bakhodir Abdurashidovich
Cand. Sci. (Med.), Associate Professor
Department of Surgical Dentistry and Dental Implantology,
Tashkent State Medical University,
Tashkent, Uzbekistan
Norbekova Charos Ilkhombek qizi
Master's Degree Holder
Department of Pediatric Surgical Dentistry,
Tashkent State Medical University,
Tashkent, Uzbekistan
Nazarova Nigina Asrol qizi
Basic Doctoral Student
Department of Pediatric Surgical Dentistry,
Tashkent State Medical University,
Tashkent, Uzbekistan

Article history:

Received: October 30th 2025
Accepted: November 28th 2025

Abstract:

Mandibular fractures in children remain one of the most significant problems in pediatric maxillofacial surgery due to the increasing incidence of maxillofacial trauma and the high risk of long-term functional and morphological sequelae. Anatomical and physiological characteristics of pediatric bone tissue contribute to an atypical clinical course of fractures, which complicates timely diagnosis and increases the likelihood of complications, including disturbances in mandibular growth, occlusal deformities, and temporomandibular joint pathology.

Despite the availability of clinical guidelines, issues related to the early detection of mandibular fractures in children and the prevention of their long-term consequences remain insufficiently systematized. In this context, synthesizing current evidence on the clinical and diagnostic features of mandibular fractures in children represents a relevant scientific and practical task.

Keywords: mandibular fractures in children, maxillofacial region

INTRODUCTION

Mandibular fractures in children are characterized by pronounced clinical specificity and significant diagnostic challenges. This is associated both with the anatomical and physiological features of pediatric bone tissue and with the child's intense reaction to trauma, fear, and pain syndrome, which lead to generalized muscular tension (fear-induced retraction) [Persin et al., 2003].

Unlike adults, children often lack the classic clinical signs of fractures, while marked soft tissue edema and hematomas may mask the true nature of the injury. It is particularly important to note that mandibular fractures in children are combined with traumatic brain injury in more than 50% of cases, which frequently remains undiagnosed and may manifest as long-term sequelae during puberty [Semenov, Vasiliev, 2000].

Anatomical, Topographical, and Age-Related Features

The bone tissue of the maxillofacial region in children differs significantly from that of adults. Pediatric bone tissue is characterized by the following features:

- lower degree of bone mineralization;
- thin cortical layer;
- substantial volume of cancellous bone;
- presence of growth zones;

World Bulletin of Public Health (WBPH)
Available Online at: https://www.scholarexpress.net
Volume-54 January 2026
ISSN: 2749-3644

• presence of primary teeth and developing permanent tooth germs [Persin et al., 2003].

In children, the periosteum is thickened, well vascularized, elastic, and resistant to tearing. It forms a kind of "sheath" around the bone, increasing its flexibility and reducing the likelihood of complete fractures. These characteristics, on the one hand, protect the facial skeleton, and on the other hand, give rise to specific fracture patterns that are unique to the pediatric population [Azimov, 2017].

Epidemiology and Causes of Fractures

Mandibular fractures are more commonly observed in boys older than 7 years, predominantly during the mixed dentition period (7–14 years) [Persin et al., 2003].

The main causes include:

• domestic trauma;
• unorganized sports and recreational activities;
• falls from bicycles, swings, and roller skates;
• road traffic accidents;
• in recent years, firearm-related injuries [Supiev, 2003].

The degree of displacement of bone fragments is directly proportional to the child's age: in adolescents aged 14–16 years, the extent of displacement approaches that observed in adults [Ivanova, Aleksandrova, 2020].

Localization of Mandibular Fractures

According to the frequency of localization, mandibular fractures are distributed as follows:

1. isolated fractures of the mandibular body;
2. fractures of the condylar process(es) (reflected fractures);
3. double and multiple fractures;
4. fractures of the mandibular angle;
5. extremely rarely, longitudinal fractures of the ramus and fractures of the coronoid process [Persin et al., 2003].

Classification of Mandibular Fractures in Children

Greenstick ("Willow Twig") Fractures

These fractures occur as a result of the high elasticity of pediatric bone. They are characterized by disruption of the cortical plate and cancellous bone on only one side, while the periosteum and the inner cortical plate remain intact [Azimov, 2017]. They most commonly occur in the region of the condylar process. The clinical presentation is often subtle, and in the absence of timely diagnosis, the fracture may progress to a complete fracture within 5–7 days [Rabukhina, Arzhentsev, 2002].

Subperiosteal Fractures

In this type of injury, the bone is completely fractured; however, the overlying periosteum remains intact, preventing displacement of the bone fragments. Occlusal disturbances, crepitus, and pathological mobility are absent, which significantly complicates diagnosis [Persin et al., 2003].

Complete Fractures of the Mandibular Body

The displacement of bone fragments depends on:

• the direction of the fracture line;
• the function of the masticatory muscles;
• the size of the bone fragments [Semenov, Vasiliev, 2000].

The degree of displacement increases as the fracture line moves farther from the central incisors. In nearly all cases, injury to the oral mucosa as well as mobility or dislocation of teeth located within the fracture line is observed.

Fractures of the Mandibular Angle

These fractures are less common. Damage to the oral mucosa and pronounced displacement of fragments are often absent. However, the following clinical signs may be present:

• malocclusion in the molar region on the affected side;
• impaired masticatory function;
• moderate edema and hematoma [Kozlov et al., 2011].

Double and Multiple Fractures

These fractures are accompanied by significant displacement of bone fragments, massive bleeding, and injury to the oral mucosa. They are particularly dangerous due to the risk of dislocation asphyxia caused by posterior displacement of the tongue root, especially in younger children. This condition may be associated with laryngospasm and airway obstruction by mucus [Supiev, 2003].

Fractures of the Condylar Process

Fractures of the condylar process represent one of the most common types of mandibular trauma in children. They typically occur as a result of a direct impact to the chin or force applied from the contralateral side [Kozlov et al., 2000].

Clinical forms include:

• subperiosteal fractures;
• unilateral complete fractures;
• bilateral complete fractures;
• fractures combined with dislocation of the mandibular head.

Clinically, these fractures manifest with pain, restricted mouth opening, occlusal disturbances, lateral deviation of the mandible, and absence of movement in the temporomandibular joint (TMJ). In cases of bilateral fractures, an anterior open bite and sagittal gap are commonly observed [Persin et al., 2003].

Traumatic Osteolysis

World Bulletin of Public Health (WBPH)
Available Online at: https://www.scholarexpress.net
Volume-54 January 2026
ISSN: 2749-3644

Traumatic osteolysis is observed following avulsion of the mandibular condylar head. Within 2–3 months after trauma, radiographic examination reveals complete resorption of the condylar bone tissue, followed by the formation of a neoarthrosis. If the injury occurs at an early age, mandibular asymmetry and growth retardation of the affected side become evident between the ages of 7 and 12 years [Azimov, 2017].

Fractures of the Alveolar Process

Fractures of the alveolar process rank among the most common facial bone injuries in children aged 8–11 years. They are accompanied by:

- rupture of the oral mucosa;
- dislocation and fractures of teeth;
- displacement of permanent tooth germs, often followed by their loss [Semenov, 2009].

Malocclusion is invariably present. Diagnosis is often challenging, as the fracture line is not always clearly visualized on radiographic imaging.

Clinical Course in Children of Different Age Groups

In younger children, mandibular fractures often have a concealed course, with edema and pain syndrome predominating. During the mixed dentition period (7–14 years), mandibular fractures are most frequent and are commonly associated with occlusal disturbances, damage to teeth, and injury to permanent tooth germs [Ivanova, Aleksandrova, 2020].

In adolescents older than 14 years, the pattern of fractures and the degree of fragment displacement approach those observed in adults. This is associated with increased bone mineralization and reduced elasticity of the periosteum [Persin et al., 2003].

Diagnosis of Mandibular Fractures in Children

The diagnosis of mandibular fractures in children presents considerable difficulties, particularly in cases of incomplete, subperiosteal, and greenstick fractures. The absence of classic clinical signs—such as pathological mobility, crepitus, and pronounced occlusal disturbances—often leads to delayed detection of injuries [Persin et al., 2003].

Clinical examination should include:

- inspection of the face and oral cavity;
- assessment of facial symmetry;
- identification of edema, hematomas, and hemorrhages;
- evaluation of occlusion and mandibular function;
- palpation of the mandibular rami, angles, and TMJ region.

Special attention should be paid to children with double fractures, as they are at increased risk of respiratory compromise and dislocation asphyxia [Supiev, 2003].

Radiographic examination in at least two projections is a mandatory diagnostic step; however, the choice of imaging modality depends on the child's age and the fracture location. In some cases, particularly with alveolar process injuries or subperiosteal fractures, the fracture line may not be clearly visualized [Rabukhina, Arzhentsev, 2002].

Potential Complications of Mandibular Fractures in Children

Mandibular fractures in children may result in a range of early and long-term complications, including:

- impaired mandibular growth;
- development of facial asymmetry;
- ankylosis or neoarthrosis of the temporomandibular joint;
- post-traumatic occlusal deformities;
- loss of permanent tooth germs;
- formation of a false joint in cases of traumatic osteolysis [Azimov, 2017].

Fractures of the condylar process at an early age are of particular concern, as damage to the growth zone may lead to pronounced developmental retardation of one half of the mandible during periods of active growth [Kozlov et al., 2000].

Importance of Timely Treatment and Follow-Up

Timely diagnosis and appropriate treatment strategies for mandibular fractures in children are crucial for preventing functional and aesthetic impairments. Even in the absence of pronounced clinical signs, children with suspected fractures should be placed under dynamic follow-up, with mandatory monitoring of mandibular function and occlusal status [Semenov, Vasiliev, 2000].

CONCLUSION

Mandibular fractures in children represent a complex clinical and diagnostic challenge. Anatomical and physiological characteristics of the pediatric population account for the high prevalence of incomplete and subperiosteal fractures, subtle clinical presentation, and an increased risk of delayed diagnosis.

Early recognition of injury, mandatory radiographic evaluation in multiple projections, and careful consideration of age-related features are key factors in preventing severe functional and growth-related disturbances of the maxillofacial region.

Thus, the specific anatomical structure of pediatric bone tissue determines the distinctive clinical course of mandibular fractures, the high frequency of incomplete and subperiosteal forms, and the risk of delayed diagnosis. A comprehensive approach incorporating clinical, radiographic, and functional assessment forms the basis for preventing serious long-term consequences of maxillofacial trauma in children.

REFERENCES

World Bulletin of Public Health (WBPH)
Available Online at: https://www.scholarexpress.net
Volume-54 January 2026
ISSN: 2749-3644

1. Persin LS, Elizarova VM, Dyakova SV. *Pediatric Dentistry*. 5th ed. Moscow: Meditsina; 2003. 640 p.
2. Semenov MG, Vasiliev AV. *Mandibular Fractures in Children*. Saint Petersburg: St. Petersburg Medical Academy of Postgraduate Education; 2000. 28 p.
3. Kozlov VA, Vasiliev AV, Semenov MG. *Management of Mandibular Condylar Process Fractures*. Saint Petersburg: St. Petersburg Medical Academy of Postgraduate Education; 2000. 32 p.
4. Semenov MG, Martyanov IN. *Traumatic Tooth Luxations in Children*. Study guide. Saint Petersburg: St. Petersburg Medical Academy of Postgraduate Education; 2009. 48 p.
5. Supiev TK. *Maxillofacial Trauma in Children*. Moscow: Medpress-Inform; 2003. 102 p.
6. Azimov MI. *Pediatric Surgical Dentistry*. Tashkent; 2017.
7. Ivanova MS, Aleksandrova EG. Mandibular fractures in children. *Molodoy Uchenyy*. 2020.
8. Zelensky VA, Mukhoramov FS. *Pediatric Surgical Dentistry and Maxillofacial Surgery*. Moscow: GEOTAR-Media; 2008. 208 p.
9. Dyakova SV. *Pediatric Dentistry: Surgical Aspects*. Moscow: Meditsina; 2009.
10. Kharkov LV, Yakovenko LN, Chekhova IL. *Pediatric Surgical Dentistry and Maxillofacial Surgery*. Kyiv: Kniga Plus; 2005.
11. Rabukhina NA, Arzhentsev AP. *Dentistry and Maxillofacial Surgery: Atlas of Radiographic Images*. Moscow: MIA; 2002. 304 p.
12. Ruzin GP. *Short Course of Lectures in Surgical Dentistry and Maxillofacial Surgery*. Kyiv: Kniga Plus; 2006. 232 p.
13. Kozlov VA, editor. *Dentistry: Textbook for Medical Universities*. 2nd ed. Saint Petersburg: SpetsLit; 2011. 487 p.
14. Kozlov VA, editor. *Dentistry: Textbook for Medical Universities*. Saint Petersburg: SpetsLit; 2003. 477 p.
15. Isakov YuF, Dronov AF, editors. *Pediatric Surgery: National Clinical Guidelines*. Moscow: GEOTAR-MED; 2009. 1168 p.
16. Bezrukov VM, Rabukhina NA, editors. *Facial Skeleton Deformities: Clinical Manual*. Moscow: MIA; 2005. 312 p.
17. McDonald RE, Avery DR, editors. *Dentistry for the Child and Adolescent*. Moscow: Medical Information Agency; 2003. 766 p.
18. Vodolatsky MP. *Pediatric Surgical Dentistry and Maxillofacial Surgery*. Stavropol; 2006.
19. Rabukhina NA. Radiological diagnosis of maxillofacial trauma in children. *Stomatologiya*. 2004.
20. Bezrukov VM. *Maxillofacial Injuries in Children*. Moscow: Meditsina; 2001.