

Human skull with TMJ and secondary comorbidities: Study in university collection

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ABSTRACT

Ankylosis of the temporomandibular joint (TMJ) is a disabling condition characterized by bone or fibrous adhesion, resulting in loss of joint function. It can cause severe limitations in jaw movements, affecting chewing, speech and breathing, and generating psychological stress. Classified according to the location and type of tissue involved, TMJ can occur due to trauma, infections, or autoimmune diseases. In the clinical case analyzed, a complete bone fusion of the joint was observed, associated with nutritional deficiencies and other comorbidities, evidenced by specific characteristics of the skull and deteriorated health conditions.

Keywords: Ankylosis of the temporomandibular joint, Bone fusion, Nutritional deficiencies.

INTRODUCTION

Ankylosis of the temporomandibular joint (TMJ) is a bony or fibrous adhesion that results in loss of function of the joint. It can occur between the condylar head of the mandible and the glenoid fossa of the temporal bone, or between the mandible and other adjacent bones. TMJ varies in degrees of restriction of mandibular movements, which can lead to complete paralysis (Manganello-Souza, Mariani, 2003). It is a disabling condition, causing speech disorders, chewing difficulty, facial disfigurement, breathing impairment, and psychological stress (Kumar *et al.*, 2014).

CLINICAL CASE

Temporomandibular joint (TMJ) ankylosis is classified based on location (intra- or extra-articular), type of tissue involved (bone, fibrous, or fibro-bone), and extent of fusion (complete or incomplete) (Chidzonga, 1999; Erdem and Alkan, 2001). It can be caused by malformation, trauma, or a combination of both. Sawhney (1986) categorized TMJ ankylosis into four types in children: type 1 has extensive fibrous adhesions with minimal fusion; type 2 shows bone fusion predominant at the outer edge of the joint; type 3 includes a bony bridge between the mandible and the temporal bone; and type 4 replaces the joint with a bone mass. The condition can be acquired due to childhood condylar trauma, septic arthritis, or systemic infections such as tuberculosis, syphilis, or smallpox (Choinard *et al.*, 2018). In addition, it can be

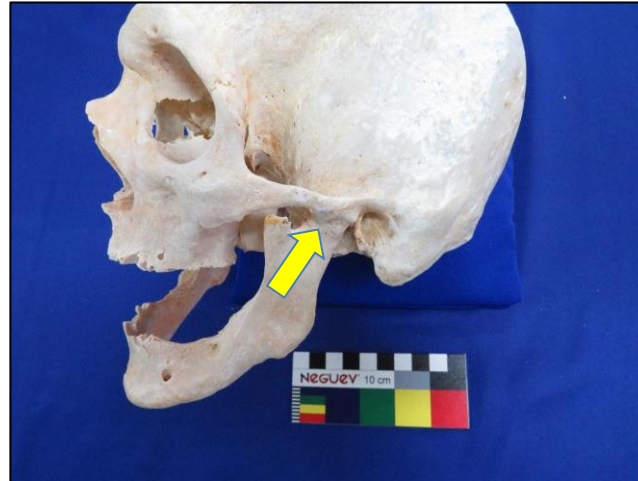
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associated with local or systemic trauma, diseases such as ankylosing spondylitis, rheumatoid arthritis, psoriasis, or condylar fractures that are not properly treated (Rodrigues, 2011).

Photograph 1 – Bone fusion in the temporal-mandibular joint.

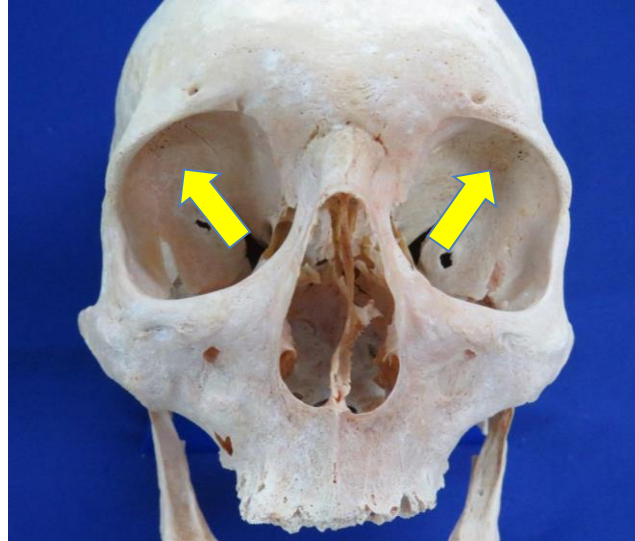


(Source: Lini and Soares, 2024)

The skull under analysis reveals complete immobility of the temporomandibular joint, indicative of inability to chew (Photograph 1). Remarkably edentulous, with closed alveoli and evidence of significant bone resorption, the skull also features *cribra orbitalia* in both eyes, with active injury observed in the left orbit and healing points, possibly indicating an improvement in the health condition of the affected individual (Photograph 2). These lesions are associated with nutritional deficiencies, such as anemia, in cases of vitaminosis C, A, B complex and worms (Hengen, 1971).

The specimen under analysis is a male skull over the age of 45, with predominantly Caucasian ancestry. It was acquired by the Dental Sculpture Laboratory of the Federal University of Mato Grosso do Sul during the 1990s, probably originating from an unclaimed burial in the municipal public cemetery of Campo Grande, Mato Grosso do Sul, Brazil.

Photograph 2 – Porosities in the upper wall of the orbital foramen by *cribra orbitalia*.



(Source: Lini and Soares, 2024)

DISCUSSION

Ankylosis of the temporomandibular joint (TMJ) probably developed in adulthood by an autoimmune condition, leading to type 4 calcification with no evidence of prior trauma to the maxillary and mandibular bones. This significantly impacted the patient's quality of life, affecting diet, speech, and self-esteem. The need for a nasogastric tube reflects nutrition concerns, while the socioeconomic origin of the skull suggests unfavorable conditions, with other comorbidities such as scurvy and *cribra orbitalia* also present.

CONCLUSION

The study of collections is essential to characterize pathologies at different stages, helping in the individual identification and analysis of health conditions throughout life. The ethical and careful preservation of these collections is fundamental not only for anatomical research, but also for critical evaluations of the living conditions and health of past populations. Understanding the factors that cause pathologies in bones preserved in research centers democratizes knowledge in forensic anthropology and anthropology of health.



REFERENCES

- Chouinard, A.-F., Kaban, L., & Peacock, Z. (2018). Acquired abnormalities of the temporomandibular joint. *Oral and Maxillofacial Surgery Clinics of North America*, 30, 83–96. <https://doi.org/10.1016/j.coms.2017.08.005>. Accessed July 11, 2024.
- Chidzonga, M. M. (1999). Temporomandibular joint ankylosis: Review of thirty-two cases. *British Journal of Oral and Maxillofacial Surgery*, 37, 123-126.
- Erdem, E., & Alkan, A. (2001). The use of acrylic marbles for interposition arthroplasty in the treatment of temporomandibular joint ankylosis: Follow up of 47 cases. *International Journal of Oral and Maxillofacial Surgery*, 30, 32-36.
- Hengen, O. P. (1971). ‘Criba orbitalia’: Pathogenesis and probable etiology. *Homo*, 22, 57-75.
- Kumar, D., Rajan, G., Raman, U., & Varghese, J. (2014). Autogenous reconstructive modalities of TMJ ankylosis: A retrospective analysis of 45 cases. *Journal of Maxillofacial and Oral Surgery*, 13(4), 359–365. <https://doi.org/10.1007/s12663-013-0504-9>
- Manganello-Souza, L. C., & Mariani, P. B. (2003). Temporomandibular joint ankylosis: Report of 14 cases. *International Journal of Oral and Maxillofacial Surgery*, 32, 24-29.
- Sawhney, C. P. (1986). Bony ankylosis of the temporomandibular joint: Follow-up of 70 patients treated with arthroplasty and acrylic spacer interposition. *Plastic and Reconstructive Surgery*, 77(1), 29–40.
- Rodrigues, D. C. (2011). Anquilose da articulação têmporo-mandibular (Monografia de especialização). Universidade Federal de Minas Gerais.