

Marzena Dominiak, Wojciech Niemczyk*, Witold Świenc, Sebastian Dominiak,
Konstanty Sławewski, Jacek Matys

Department of Oral Surgery, University Dental Center in Wrocław,
26 Krakowska Street, 50-425 Wrocław, Poland

* Corresponding presenter and author: Wojciech Niemczyk; wojciech.niemczyk@umw.edu.pl

Keywords: osteolytic lesions; fatty bone marrow degeneration; CBCT; diabetes mellitus; panoramic radiography; mandible



1. BACKGROUND

- Osteolytic lesions suspected of fatty degenerative osteonecrosis of the jaw / marrow fatty infiltration may remain clinically silent and can be missed on routine 2-dimensional imaging.
- Cone beam computed tomography enables a more detailed assessment of jaw bone structure and low-density intra-medullary changes.
- The study evaluated lesion prevalence and potential associations with age, sex, and selected systemic diseases.



2. OBJECTIVE

- To determine the prevalence of osteolytic lesions in the maxilla and mandible suspected of fatty bone marrow degeneration.
- To assess their radiologic characteristics and relationship with selected clinical and systemic factors.



3. MATERIALS AND METHODS

- Retrospective analysis of 1,000 consecutive adult CBCT examinations performed between 2019 and 2025.
- Assessment of lesion presence, location, largest diameter, relative gray-scale values, and visibility on panoramic radiography.
- Clinical variables: age, sex, osteoporosis, hypertension, cardiovascular diseases, diabetes mellitus.
- Statistics: Mann–Whitney U test, Pearson chi-square test, logistic regression.
- Setting: archived CBCT scans and medical records; no additional patient procedures.



4. STUDY POPULATION / KEY NUMBERS



1,000
adult
patients



45.2%
with lesions
suspicious for
fatty bone
marrow
degeneration



52.6%
female
47.4%
male



Median age
47 years
[31–54]



7.8%
diabetes
mellitus



21.1%
hypertension



5. MAIN RESULTS

- Lesions suspicious for fatty bone marrow degeneration were identified in 452 of 1,000 patients (45.2%).
- Prevalence increased with age.
- Patients with lesions were significantly older than those without lesions.
- Diabetes mellitus remained independently associated with lesion presence: odds ratio 1.647, 95% confidence interval 1.022–2.686, $p = 0.042$.
- Age also remained independently associated: odds ratio 1.015 per year, 95% confidence interval 1.008–1.025, $p = 0.001$.
- Most lesions were not visible on panoramic radiography (60.2%).
- Lesions visible on panoramic radiography were significantly larger.
- Lesions were found predominantly in the mandibular retromolar regions.



6. VISUAL RESULTS AREA

Chart 1. Prevalence by age group

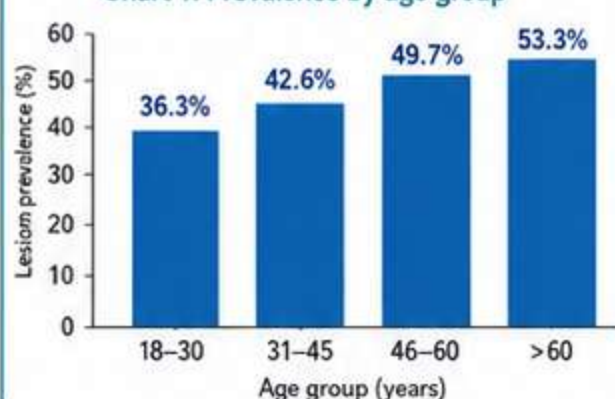


Chart 2. Lesion location distribution

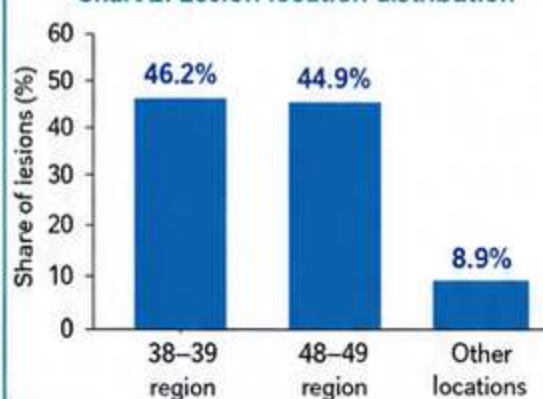
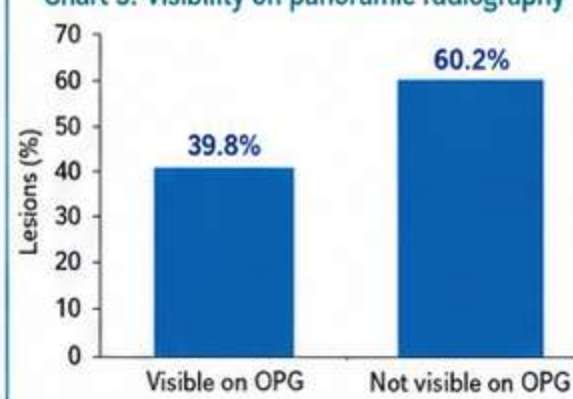


Chart 3. Visibility on panoramic radiography



7. INDEPENDENT PREDICTORS

Variable	Odds Ratio (OR)	95% Confidence Interval	p-value
Age (per year)	1.015	1.008–1.025	0.001
Diabetes mellitus	1.647	1.022–2.686	0.042



8. CLINICAL SIGNIFICANCE



Routine panoramic imaging may underestimate the burden of osteolytic jaw lesions.



CBCT provides substantial added diagnostic value, particularly in older patients and those with diabetes.



Recognition of these lesions may improve diagnostic awareness and treatment planning in oral surgery and implant dentistry.



9. CONCLUSIONS



- Osteolytic lesions suspected of fatty bone marrow degeneration were common in this CBCT population.
- Most lesions were occult on routine panoramic imaging.
- Older age and diabetes mellitus were associated with lesion presence.
- Cone beam computed tomography is valuable for the diagnosis of these lesions in everyday clinical practice.



10. SELECTED REFERENCES

- Naitoh M et al. Dentomaxillofac Radiol. 2005.
- Doriwalla M, Mezencev R, Pohjola A, Shevelov N, Mähys J. Int J Mol Sci. 2023;24(9).
- Liziolać-Zychta B et al. Med Oral Patol Oral Cir Bucal. 2016;21(2):e96–e104.
- Ruggiero SL et al. J Oral Maxillofac Surg. 2022;80(2):9–83.
- Naitoh M, Lodi G et al. Int J Oral Maxillofac Surg. 2019;48:1241–1249.
- Pirovano C et al. Bone. 2016;91:422–429.