



AGE-RELATED COMORBIDITIES AND SURGICAL MANAGEMENT OF DELAYED FRACTURE HEALING POST-COVID-19

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Annotation

Post-COVID-19 patients experience long-lasting systemic effects that impair bone healing. Age-related comorbidities such as cardiovascular, endocrine, and genitourinary diseases complicate the recovery process after bone fractures. This article provides scientific research information on age-related concomitant diseases and surgical treatment of delayed healing of fractures after COVID-19.

Keywords: bone healing, Post-COVID-19, patients, bone fractures.

Relevance:

Post-COVID-19 patients experience long-lasting systemic effects that impair bone healing. Age-related comorbidities such as cardiovascular, endocrine, and genitourinary diseases complicate the recovery process after bone fractures. In elderly patients with hip fractures, delayed surgeries due to the pandemic have shown better outcomes in terms of hip function and reduced complications compared with non-operative management, although the delays themselves are a consequence of overburdened healthcare systems. Aging inherently impacts the inflammatory response during fracture healing due to immune senescence and increased systemic pro-inflammatory status. Key cells involved in the inflammatory response, such as macrophages, T cells, and mesenchymal stem cells, undergo intrinsic age-related changes that may impede fracture healing. In addition, vascularization and angiogenesis are impaired, and osteochondral cells and their progenitors exhibit decreased activity and cell numbers in the bone callus, further complicating the healing process. The COVID-19 pandemic has exacerbated these issues by changing patient behavior and healthcare dynamics. Moreover, reluctance to seek medical



care during the pandemic has led to delays in hospitalization and treatment, which may have worsened outcomes for patients with fractures.

Purpose of the study: To analyze age-related comorbidities and preferred surgical approaches in patients with delayed long bone fracture consolidation after COVID-19.

Materials and Methods: 126 patients aged 18–90 years with long bone fractures and a history of COVID-19 were evaluated. Data were gathered via anamnesis, clinical examination, and standard diagnostic tools. Statistical analysis was conducted using SPSS 22.0 and Statistica 10.0 ($p < 0.05$).

Research Results: A significant age-related increase in comorbidities was observed among patients, with cardiovascular diseases reaching a prevalence of 93.3% in the oldest age group. Endocrine disorders were found in up to 60% of elderly patients, indicating a strong correlation between age and metabolic dysregulation. Genitourinary diseases also became more frequent with age, affecting up to 86.7% of patients in the advanced age group. The highest levels of obesity were detected in young and middle-aged patients, with a subsequent decline noted in older age categories. Due to the predominance of simple fractures, suprapariosteal osteosynthesis was the most commonly used surgical method, followed by intramedullary fixation and the Ilizarov technique.

Conclusion:

The risk of delayed consolidation increases with age-related comorbidities. Tailored treatment plans considering age, fracture type, and metabolic status are crucial in post-COVID-19 traumatology.

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International Conference on Scientific Research in Natural and Social Sciences

Hosted online from New York, USA

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2nd August, 2025

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