

## How serious is Osteomyelitis?

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Osteomyelitis is a serious condition and if it is left untreated, the infection can advance to other joints and other parts of the body. This will lead to widespread infection and septic and even bone death by affecting the blood circulation within the bone. Orthopaedic surgeon will need to amputate the infected bone and tissue surrounding it to check the further spreading of the infection leading to severe disability. Infection from bone may transfer to blood and can cause blood infection resulting in blood poisoning (septicemia) fatal illness and multiple organ failure.

In some cases, chronic infectious draining sites and the surrounding skin can evolve into a squamous-cell type of skin cancer. In recent studies, serious neurological complications secondary to abscess have been reported associated to spinal osteomyelitis. Osteomyelitis can be cured if treated early. In case of chronic infection, prognosis may take time and sometime amputation is the last resort. Mortality rates associated with it are generally low unless there is a presence of chronic or serious concomitant illness.

Deaths are very rare and were common before commencement of antimicrobial regimen. Sometime, it happens in patients who have osteomyelitis of spine for a long time, due to infection of membranes surrounding the spinal cord and brain.

Parasitic infection and its effect on stem cell signaling is one of the oldest theories of cancer origin [1]. Currently, it is accepted that the association of chronic infection and development of malignancies may be underestimated. Some authors acknowledge that over 25% of malignant neoplasms may originate from chronic inflammation and infectious agents. There is a considerable body of evidence for some of these associations, such as between *Salmonella typhi* and hepatobiliary carcinoma; *Opisthorchis viverrini* and *Clonorchis sinensis* and *cholangiocarcinoma*; *Schistosoma hematobium* and bladder cancer; and between hidradenitis suppurativa and cutaneous squamous cell carcinoma, among others [2,3].

The exact mechanism of malignant transformation remains unknown. It is assumed that, in a multifactorial manner, the chronic inflammatory state behaves as a promoter in the complex process of carcinogenesis [3]. Malignant transformation begins in the skin or epithelium of the fistula and infiltrate the adjacent tissues, including bone [4,5]. The prevalence of malignant transformation in the setting of chronic osteomyelitis ranges from 1.6% to 23%, and the most commonly affected bones are the tibia and femur.

The most frequently observed malignant transformation is squamous cell carcinoma of the skin [6,7]. The increase in fistulous drainage, as well as persistence, exophytic growth of an ulcer or mass can be warning signs for malignant transformation [8]. All patients with

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ulcers and fistulas associated with chronic osteomyelitis should be frequently and carefully followed-up, and any characteristic alterations in a chronic wound should raise the suspicion of malignant transformation [9].

Diagnosis is confirmed through biopsies, which should be performed early in multiple locations and depths, including ulcers, fistulas, and bone, in order to increase diagnostic accuracy and reduce the number of false negatives [10]. When malignant transformation is diagnosed, it is essential to stage the neoplastic disease and to assess the presence of distant metastases through studies by computerized tomography, magnetic resonance imaging, and positron emission tomography [9].

The definitive and most frequently used surgical treatment in these situations, considering that the majority of patients have advanced disease, is the proximal amputation of the neoplasia [7]. Adjuvant chemo radiotherapy is indicated in metastatic disease and high-grade tumors [11]. In selected patients without metastatic disease, limb-sparing extended tumor excision with limb salvage may be chosen.

The main prognostic factor is the staging of the neoplastic disease [7]. In most cases, chronic osteomyelitis in squamous cell carcinoma is aggressive, with high levels of local recurrence and metastasis. Metastasis is observed early (in most cases, in the first 18 months after malignant transformation) and is mainly located in the lymph nodes [12].

However, if the patient does not present metastatic disease during the first three years and the tumor lesion has been excised correctly, prognosis is favorable [12]. Early diagnosis and aggressive treatment of the malignant transformation of chronic osteomyelitis are critical to the prognosis and final results. The most effective method of preventing the onset of these malignancies is appropriate and definitive treatment of chronic osteomyelitis, debridement, and antibiotic therapy.

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