

## Occurrence of Pathological Fractures among Patients Admitted to Al-Khair Hospital, Kabul, Afghanistan

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### ABSTRACT

**Background:** Pathological bone fracture is one of the types of bone fractures that occur in people due to various reasons and causes. We aimed to investigate the frequency of pathological fractures in patients referred to Al-Khair Hospital, Kabul, Afghanistan, in the second half of 2024.

**Methods:** This study was a cross-sectional descriptive study performed on patients with pathological fractures referred to Al-Khair Hospital. Necessary information was collected from the patients' files.

**Results:** Of 210 patients, 52 had pathological bone fractures; the overall prevalence in this hospital was 24.76%. Based on gender, out of 52 patients, 16 (30.77%) were male, 36 were female (69.23%). Based on age, the highest frequency of pathological fracture was in the age group of 60–70 yr, which was 23 patients, and the lowest frequency was in the age group of 30–40 yr, which was 1 patient. According to the cause, osteoporosis was the most common in 22 patients (42.31%).

**Conclusion:** The overall prevalence of pathological bone fractures in Al-Khair Hospital was 24.76%, and the majority of cases were female. According to the cause, osteoporosis had the highest frequency rate.

**Key word:** Pathological bone fracture; Complications; Osteoporosis; Afghanistan

## Introduction

Pathological fractures are bone fractures that occur in bones weakened by underlying disease rather than by significant trauma. Pathological bone fractures are among the common clinical problems today, occurring secondary to underlying pathological conditions in the patient's body.

Some regional studies have reported that the prevalence of pathological fractures can be around 5% [1]. In Iran, more than 170,000 osteoporotic fractures occur annually [2]. However, no reliable epidemiological data are currently available for Afghanistan, and the prevalence of pathological fractures in Kabul or other

provinces remains undocumented. This gap highlights the importance of conducting localized studies to provide baseline evidence for clinical practice and health policy in the Afghan setting unlike previous statements [3], not all pathological fractures are caused by systemic diseases; some may result from local lesions or bone cysts.

The main causes include congenital disorders, systemic diseases, Cushing's syndrome, nutritional rickets in infants, and sialic acid rickets [4]. The clinical symptoms of bone fractures include pain and tenderness at the fracture site, swelling, bruising, deformity of the limb, ab-

normal or unstable movement, and in some cases, shock [5]. Pathological bone fractures can lead to secondary complications and impose a significant financial burden on families [5]. Each year, approximately 1.7 million individuals in the United States are diagnosed with cancer, with metastatic bone disease affecting nearly 5% of these patients. About 8% of patients with metastatic bone cancer experience pathological fractures. In contrast, primary sarcomas of soft tissue and bone are much rarer, affecting approximately 13,000 and 3,600 individuals annually in the United States, respectively [6-8].

According to global statistics, 10 to 20 million people live with the consequences of poliomyelitis, with approximately 6.5 million of them residing in India. Poliomyelitis contributes to bone fractures through two main mechanisms: 1) falling and 2) osteoporosis [9, 10]. Risk factors for pathological fractures include age, gender, race, family history, lifestyle, history of trauma, medication use, and heavy physical activity [7]. In developed countries such as the United Kingdom, Germany, Sweden, and China, the incidence of this condition is relatively low. However, in developing countries such as Iran, Pakistan, the prevalence is significantly higher [11]. Despite the high prevalence of pathological fractures in the region, there is a lack of published data specifically from Kabul, Afghanistan, highlighting the need for localized studies.

Therefore, we aimed to determine the prevalence and characteristics of pathological fractures among patients admitted to Al-Khair Hospital, Kabul, Afghanistan.

## Materials and Methods

This research was conducted as a descriptive cross-sectional study involving patients diagnosed with pathological bone fractures and sought treatment at Al-Khair Hospital in Kabul, Afghanistan, during the latter half of 2024.

**Study population and sampling:** Overall, 210 medical records belonging to patients who came to the hospital during the designated time frame were examined. Fifty two of these individuals were chosen as the study sample since they satisfied the requirements for pathological fractures. Because complete medical records were available, a non-random, consecutive sampling strategy was used.

**Inclusion criteria:** Patients who had pathological fractures confirmed by radiology and/or clinical examination, were older than ten years, and had all available clinical and demographic information in their records were eligible to be included. Inclusion criteria were: (1) patients with radiologically and/or clinically confirmed pathological fractures, (2) age above 10 yr, and (3) complete demographic and clinical data available in records.

**Exclusion criteria:** (1) fractures caused by high-energy trauma or accidents, (2) incomplete or missing medical files, and (3) patients with uncertain diagnoses. Fractures brought on by high-energy trauma or accidents, insufficient or missing medical records, and patients with unclear diagnoses were among the exclusion criteria.

**Definition and diagnostic criteria:** A pathological fracture are one that does not result from high-impact trauma but rather from underlying disorders including osteoporosis, metastatic bone disease, bone cysts, or other localized lesions that weaken the bone. Radiographic imaging, clinical history, and, in certain situations, histological confirmation was used to make the diagnosis.

**Data collection:** Data such as patient demographics (age, gender), fracture location, and underlying reasons (e.g., osteoporosis, cancer, metabolic disorders) were taken from computerized hospital databases and medical records.

**Data analysis:** SPSS was used to enter and analyze the data ver. 25, (IBM Corp., Armonk, NY, USA). The data was compiled using descriptive statistics (frequency, percentage). In

order to handle lacking data, incomplete cases were eliminated from the final analysis.

**Ethical approval and consent:** The Declaration of Helsinki's (2013 revision) ethical guidelines were followed. The study was approved by the Al-Khair Hospital Authorities prior to data collection.

## Results

Overall, 52 patients (24.75%) presenting to Al-Khair Hospital during the study period were diagnosed with pathological bone fractures (Table 1). As shown in Table 2, females were more frequently affected than males, indicating

a higher burden of pathological fractures among women. The patients' ages ranged from 10 to 90 years, with the majority belonging to the older age groups, particularly those aged 61–70 years (Table 3). Since no cases were reported in the age group of 21–29 years, a noticeable discrepancy was observed. As shown in Table 4, osteoporosis was the most common cause of pathological fractures, followed by osteomalacia and bone tuberculosis, while other causes were relatively less frequent. In this cohort, osteoporosis is the primary cause of pathological fractures, with less frequent contributions from other systemic and local diseases.

**Table 1:** Number and percentage of patients visiting Al-Khair Hospital

<i>Patient</i>	<i>Number</i>	<i>Percentage</i>
Total Patient	210	100
Bone pathological cases	52	24.75

**Table 2:** Number and percentage of bone pathological cases by gender

<i>Gender</i>	<i>Number</i>	<i>Percentage</i>
Total Patient	52	100
Male	16	30.77
Female	36	69.23

**Table 3:** Number and percentage of pathological bone fractures by age

<i>Age group(yr)</i>	<i>Count</i>	<i>Percentage (%)</i>
10-20	2	3.85
21-30	0	0
31-40	1	1.92
41-50	6	11.54
51-60	11	21.15
61-70	23	44.23
71-80	8	15.38
81-90	1	1.92

**Table 4:** Number and Percentage of Pathological Bone Fractures by Cause of Prevalence

<i>Cause of Prevalence</i>	<i>Number</i>	<i>Percentage</i>
Osteoporosis	22	42.31
Bone Tuberculosis	8	15.38
Osteomalacia	11	21.15
Rickets	2	3.85
Metastatic Breast Tumor	2	3.85
Metastatic Prostate Tumor	1	1.92
Bone Cyst	2	3.85
Osteomyelitis	3	5.77
Medication induced	1	1.92

## Discussion

The results of the present study showed that out of 210 evaluated cases, 52 cases (24.75%) had pathological bone fractures. Among these, 30.77% were male and 69.23% were female. The most affected age group was between 60 and 70 yr old.

In a 2017–2019 research of 458 hip fracture patients in Qatar, less than 3% of these fractures were caused by underlying bone disease, meaning that just 9 instances (2%) were pathological (such as malignancy or metastases). This conclusion is inconsistent with our study's findings, which showed that 24.75% of hip fractures were pathological. The disparity might be explained by variations in the study population, referral trends, diagnostic standards, or the frequency of underlying illnesses such as cancers in the corresponding cohorts [12].

Patients with pathological femur fractures are more likely to be female, according to many recent research. For instance, one of the main primary tumors producing pathological fractures is breast cancer, which is more prevalent in women. This conclusion is in line with our findings, which showed that women accounted for the majority of pathological fractures (69.23%). Therefore, our cohort's gender distribution is consistent with these recent findings [13].

Our results are consistent with recent publications on the age distribution of hip fractures.

The middle age group, also shown to have the greatest fracture incidence, accounted for the bulk of pathological hip fracture patients in our study. According to Niemöller et al., who examined fracture incidence from 2017 to 2021, people between the ages of 61 and 80 accounted for the greatest percentage of fractures, including femur fractures. This correlation demonstrates that this age group is a particularly susceptible demographic for pathological hip fractures and validates the validity of our findings [14].

With 42.31% of cases, osteoporosis was the most common underlying cause of pathological fractures in our study. This result is in line with a previous study that discovered almost all (97.95%) of fracture patients had osteopenia or osteoporosis, and 69% of them had verified osteoporosis (T-score < -2.5). Both studies emphasize the critical role that low bone mineral density plays in the development of pathological fractures, despite the fact that the precise proportions vary. This emphasizes the need of early detection and preventative measures in at-risk individuals [15].

## Limitations

First, because it is single-center research, the results may not be as applicable to different populations or healthcare environments. Second, because retrospective records may contain inconsistent or missing information, data com-

pleteness and quality may have an impact on the accuracy of reported results. Lastly, the sample might not be entirely typical of the general population, especially when it comes to underlying comorbidities, age distribution, and referral patterns. When evaluating the results, these restrictions should be taken into account.

**Clinical and Policy Implications:** There are significant clinical and policy ramifications to the results. The fact that osteoporosis is the primary cause of pathological hip fractures emphasizes the necessity of focused screening and preventative measures in vulnerable groups, particularly women and older persons. To lower the prevalence of fragility and pathological fractures, clinicians should place a high priority on early diagnosis, bone health enhancement, and fall prevention techniques. By a policy standpoint, healthcare systems might gain by funding fracture prevention and putting in place organized osteoporosis

**Future Research Suggestions:** To enhance generalizability and data quality, future research should concentrate on prospective, multi-center investigations. Long-term results, the financial viability of preventative measures, and interventional research aimed at high-risk groups might all be investigated. Furthermore, assessing how comorbidities, gender disparities, and geographical variations in osteoporosis prevalence affect the rates of pathological fractures may yield stronger data for clinical and policy decision-making.

## Conclusion

Our findings underscore the need for targeted screening and preventive measures for osteoporosis in vulnerable populations, particularly older women in Afghanistan. However, a multi-center study is needed to further generalize these findings, and caution is advised due to the limitation of inviting fractured patients to Al-Khair hospital within the city limits.

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## Conflict of Interest

The authors declare that there is no conflict of interests.

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