

Recommendations for oncological orthopaedics in the Covid-19 pandemic; Review of the literature and clinical experiences

Coşkun Ulucaköy^{1*}, Ismail Burak Atalay¹, Aliakber Yapar¹, Mehmetakif Şimsek¹, Recep Öztürk¹, Güray Toğral¹, Bedii Şafak Güngör¹

Abstract

Objective: The Covid-19 pandemic which arose from Wuhan city in December 2019 led to some changes in the treatment and follow-up of orthopedic patients to protect both the patients and the health workers and their relatives from the contagion. Long-term settings for the sake of patients and health workers have been made to decrease the viral load and the Covid-19 transmission risk. The specialist opinions and the data coming from Italy and Spain where the pandemic affected earlier than most countries facilitated the necessary steps to take in oncologic orthopaedics. These steps in general, it should be limited to acute cases such as pathological fractures and malignant tumors. During the acute phase of the pandemic; it requires postponement of all other oncological orthopedic cases and outpatient controls. All surgeries where delaying 3 months will not be a big problem in the long term should be kept waiting.

Keywords: Pandemic, Covid-19, Oncological Orthopaedic

Introduction

In December 31 2019, the health commission in Wuhan city of China reported 27 pneumonia cases to National Health Commission, China Disease Control Center (CDC), and World Health Organization (WHO) (1). In January 7 2020, China CDC discovered a new coronavirus (2019-nCoV) known as “Wuhan Coronavirus” in the local language.

WHO renamed it as SARS-CoV-2 to relate the virus to the disease symptomatology and not to describe the relationship between the virus and any geographical place and nationality. In January 30 2020, WHO declared this viral pneumonia as an emergent situation. Spreading all over the world in 3 months, WHO declared the pandemic on 11 March 2020 (1). By 19 May 2020, the coronavirus infected 4,911,839 patients and caused 320,458 deaths (2). Infected cases and casualties have been increasing day by day.

The pandemics of new Coronavirus (COVID-19) known also as SARS-CoV-2 has loaded a great burden on the shoulders of health systems all around the world. Operational disciplines suggested postponing the elective surgeries in the face of this pandemic which obliterated the world health systems. Orthopedists have made decisions on which patients to operate in order to decrease the viral load and to prevent the contagion and they also had to change the way they give health service (3).

However, in oncological orthopaedics, it is arguable which case is elective due to the immune-suppressed conditions of most patients. The literature review on various fields such as the in-patient care and the welfare of the doctor is looked at.

It is important that the health workers who serve in the oncological orthopedic area must admit this pandemic as an evolving and progressive entity; Therefore everybody must be prepared to be flexible, ready to transform according to the changing environment. For this reason, health professionals must get informed about the last protocols using resources such as AAOS (American Academy of Orthopaedic Surgeons) web site and Center for Disease Control (CDC) web site.

General Principles

The Covid-19 Pandemic has necessitated significant changes in the current implementation methods. Oncological Orthopaedics professionals must have revised the pre—contagion treatment protocols to decrease the transmission risk. Conservative treatments must be kept at the forefront in the acute phase of the contagion. Emergent operations must be performed under the utter precautions and with personal safety equipments.

The use of telemedicine and online file sharing applications in oncological orthopaedics might contribute to the



protection of the medical staff and patients from the COVID-19 spread (4).

ESMO (European Society of Medical Oncology) has also made recommendations for oncology patients without COVID-19 symptoms. Soft tissue sarcomas and malignant bone tumors might continue to be operated. Neoadjuvant chemotherapy, adjuvant chemotherapy and radiotherapy must not be delayed. Tumors with high malignant potential such as Ewing's or osteosarcoma must be treated like the way before the Covid-19 pandemic (5). For the tumors with lower malignant potential such as desmoid fibromatosis, active follow-up must be done and intervention must be considered only if any progression occurs (6).

American Academy of Orthopaedic Surgeons classified the major orthopedic operations according to how long they could be safely delayed considering the studies in the literature.

They have categorized orthopaedic surgeries into 5 categories based on priority: Priority A (emergency surgery within 24 hours), Priority B (urgent surgery within <48 hours), Priority C (Expedited Surgery within 2 weeks), Priority D (Short-Term Delayed <3 months), and Priority E (Long-Term Delayed >3 months). When considering this study in terms of oncological orthopedics, "impending pathological fractures" are in priority B category. In the same table, "Surgical Spine Tumor with Cord Compression" is in priority A category (4).

Patient Selection for Surgery

All the operations that were thought not to lead important problems in three months, were delayed. The patients who presented with acute pathological fracture and the ones with malignant tumors of which the tumor load could increase have been continued to be operated considering the Covid-19 precautions.

In the pandemic period while the benign soft tissue tumor operations have been delayed; sarcoma operations have continued by council decision. Nonetheless, in borderline aggressive tumors (such as fibromatosis) the decision must be made uniquely for each patient. The decision must be made considering the patient's age, the localization of the tumor, the grade, the type of tumor, and the comorbidities.

While the benign soft tissue tumor operations have been delayed; sarcoma operations have continued. For the benign bone tumors with fracture risk and benign aggressive bone tumors (giant cell tumor, aneurysmal bone cyst), the decision must be made uniquely for each patient.

The decision must be made considering the patient's age, the localization of tumor, the grade, the type of tumor and the comorbidities. Due to the fact that malignancy could not be always clinically and radiologically excluded in benign aggressive tumors, the decision for those patients must be given by discussing in the tumor council. Similarly, for the lesions that are close to the joint cartilage such as giant cell tumor and aneurysmal bone cyst, an operation for sparing the joint might be decided.

Chemotherapy and radiotherapy protocols must go on taking the necessary steps as being neoadjuvant and

adjuvant. The patients whose neoadjuvant treatment process is complete are discussed in the tumor council and the decision has been made by a multidisciplinary team (oncological orthopaedist, medical oncologist, radiation oncologist, pathologist and psychologist). The patient's age, comorbidities, cigarette usage, and immune-suppressed condition have been considered.

The decision process for the operation is also a process in which the decision is made together with the patient. Covid-19 symptoms are questioned for all the patients who we decide to operate and the patient is isolated in the Covid-19 service until the screening results are seen and the operation is suspended. Despite all these, from the first day to the day of discharge, all patients are treated as if they are Covid-19 positive. The procedures are performed by taking all the personal cautions. The number of operation room staff is limited to a minimum number.

Protection of Health Staff and the Patients

Health staff has started to work as rotatoryly and the number of visitors in the service is limited. The necessary information and the training about the protective equipment and hand hygiene have been given to the health staff. Lessons have been continuing isolatedly on the computer using the technological facilities. The number of polyclinics is decreased and the polyclinic started to serve only for emergent and indispensable situations.

Fever is measured during entering into and going out the hospital. Mask wearing is made obligatory. During the surgery, protective equipment such as glasses, mask, and visors are used by the entire health team.

The hospital restaurant has been designed according to social distancing rules. The number of staff is decreased to a minimum number for the night shifts. The staff who had close contact with Covid-19 patients and the ones with symptoms are screened immediately and isolated. Moreover, the staff are divided into groups to work in the polyclinic, operation room, and service.

The patients and the next-of-kins are obliged to use masks and to keep the social distancing rules both before and after surgery. They have been informed about how to protect themselves and hand hygiene before the hospitalization. Fever measurements have been made and recorded frequently for all patients. All patients are questioned for suspicious close contacts. The discharges of the patients are planned early postoperative period and the patients are isolated during hospitalization.

Recommendations

Our clinic is experienced in differentiating emergent and elective cases due to its experience with oncologic orthopedics during the last 30 years. However treatment protocols must have been updated for this pandemic which is experienced for the first time. Our clinic has kept being a pioneer for serving by developing rapid algorithms. The aim is to protect the health staff and the patients and to provide the treatment not to cease. The treatment algorithm is summarized below (Table 1).

Table 1 : Patient Selection for Surgery

Group type	Surgery time	Diseases
Group A	Within the first 24 hours	Oncological cases with the orthopedic emergency (such as vascular-nerve damage)
Group B	Within 1 week	1.Malign bone tumors (Osteosarcoma, Ewing sarcoma, chondrosarcoma, fibrosarcoma, multiple myeloma, lymphoma, cordoma) 2. Malignant soft tissue sarcomas (liposarcoma, pleomorphic sarcoma, fibrosarcoma, synovial sarcoma, extra-skeletal sarcoma, rhabdomyosarcoma) 3. Metastaz on; if there is a risk of fracture or cure is intended
Group C	Active monitoring, decide on follow-up	1.Benign aggressive bone tumors (osteoblastoma, chondroblastoma, chondromyxoid fibroma, aneurysmal bone cyst, giant cell tumor, osteo-fibrous dysplasia) 2. Local aggressive soft tissue tumors (fibromatosis, pigmented villonodular synovitis) 3. Metastases; if there is no risk of fracture or cure is not intended
Group D	After pandemic	1.Benign bone tumors (Osteoid osteoma, enchondroma, osteochondroma, non-ossifying fibroma, fibrous dysplasia, eosinophilic granuloma, simple bone cyst) 2.Benign soft tissue tumors (lipoma, hemangioma, neurofibroma, nodular fasciitis)

As a result, soft tissue sarcomas, malignant bone tumors, and benign aggressive borderline tumors can be operated in this process. However, this surgery decision should be made specifically for each patient, and it should be decided together with the patient and tumor council. During the operation, healthcare personnel must comply with the disease control and Prevention Centers (CDC) guidelines and protect themselves and their environment with full protective equipment.

Acknowledgement, Funding: None.

Author's contributions: YAÜ, OD; Study design, Data Collection and analyses OD; Article preparation and revisions

Conflict of interest: The authors declare that they have no conflict of interest. The study was authorized by the Harran University Medical Faculty local ethics committee

References

1. Suzanne AA. A pest in the land: new world epidemics in a global 1. Outbreak of pneumonia of unknown etiology in Wuhan, China: The mystery and the miracle. Lu H, Stratton C, Tang Y. *J Med Virol*. 2020;92:401–402.
2. Wuhan coronavirus pandemic. Accessed 2020 21 april <https://www.worldometers.info/coronavirus/>
3. Chang Liang Z, Wang W, Murphy D, PoHui JH: Novel Coronavirus and Orthopaedic Surgery: Early Experiences from Singapore. *J Bone Joint Surg Am* 2020;00:745-749.
4. Massey, P. A., McClary, K., Zhang, A. S., Savoie, F. H., & Barton, R. S. (2020). Orthopaedic Surgical Selection and Inpatient Paradigms During the Coronavirus COVID-19 Pandemic. *JAAOS-Journal of the American Academy of Orthopaedic Surgeons*.
5. Casali, P. G., Bielack, S., Abecassis, N., Aro, H. T., Bauer, S., Biagini, R., ... & Brodowicz, T. (2018). Bone sarcomas: ESMO–PaedCan–EURACAN Clinical Practice Guidelines for diagnosis, treatment and follow-up. *Annals of Oncology*, 29(Supplement_4), iv79-iv95.
6. Kasper, B., Baumgarten, C., Garcia, J., Bonvalot, S., Haas, R., Haller, F., ... & Gronchi, A. (2017). An update on the management of sporadic desmoid-type fibromatosis: a European consensus initiative between Sarcoma PATientsEuroNet (SPAEN) and European Organization for Research and Treatment of Cancer (EORTC)/Soft Tissue and Bone Sarcoma Group (STBSG). *Annals of Oncology*, 28(10), 2399-2408.