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Hip Fractures during the COVID-19 Pandemic: Our Experience in a General Hospital in Singapore

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Abstract

Introduction: Corona Virus 2019 (COVID-19) pandemic has spread rapidly and has caused overwhelming stress in healthcare systems worldwide. While the main focus of most healthcare systems are on measures in dealing with COVID-19 cases, we aimed to look at making essential services available for non-COVID-19 patients and to describe our experience in handling proximal femoral fractures in the elderly patients in Singapore. **Methods:** We retrospectively reviewed cases of hip fracture surgeries on patients ages 65 years old and above at a single institution from 1 January 2020 – 30 April 2020. **Results:** The study had a total of 153 cases of hip fracture surgeries. The patients had a mean age of 82 years old (65-107) with 30% (46) males and 70% (107) females. There were 48% (74) neck of femur fractures and 51% (79) intertrochanteric fractures. **Conclusion:** Preparations for future pandemics should include measures to handle vulnerable group of patients such as elderly patients with Hip fractures. Maintaining optimized care, ensuring good outcomes and preventing mortality from these non-COVID-19 patients should still be maintained while maintaining protection and preventing burn out of the healthcare staff.

Keywords: Hip Fractures, COVID-19, Pandemic, Essential services.

INTRODUCTION

Corona Virus 2019 (COVID-19) was first identified in Hubei Province, China in December 2019 [1]. The disease rapidly spread worldwide and by 11 March 2020, World Health Organization declared the disease as a pandemic [2]. As of 25 May 2020, the worldwide number of cases total to 5,206,614 with 337,736 deaths [3].

In Singapore, the screening of incoming travellers started as early as 2 January 2020 and the first COVID-19 case was identified on 23 January 2020. By 4 February 2020, a local cluster of COVID-19 positive cases was identified. As the worldwide and local case numbers increased, Singapore prepared itself for community spread. Singapore's Disease Outbreak Response System Condition (DORSCON) was raised from Yellow to Orange on 7 February 2020 [4]. [Figure 1]

	GREEN	YELLOW	ORANGE	RED
Nature of Disease	Disease is Mild OR Disease is severe but does not spread easily from person to person	Disease is severe and spreads easily from person to person but is occurring outside Singapore OR Disease is spreading in Singapore but is (a) typically mild or (b) contained	Disease is severe AND spreads easily from person to person, but disease has not spread widely in Singapore and is being contained	Disease is severe AND is spreading widely
Impact on Daily Life	Minimal disruption e.g. border screening, travel advise	Minimal disruption e.g. additional measures at border and/or healthcare settings expected, higher work and school absenteeism likely	Moderate disruption e.g. quarantine, temperature screening, visitor restrictions at hospital	Major disruption e.g. school closures, work from home orders, significant number of deaths

Figure 1: The Disease Outbreak Response System Condition (DORSCON) is a color-coded framework developed by the Singapore government to reflect the current disease situation

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By the end of March 2020, Singapore faced an increase in new local clusters and in local unlinked cases. While countries such as China, Italy, Spain and France implemented complete lockdowns, Singapore adopted a different approach. A nationwide "circuit breaker" was implemented on 7th April 2020. This meant closure of all non-essential services to curb the spread of disease in the community [5].

The COVID-19 pandemic introduced overwhelming stress to healthcare systems. This led to the reorganization of healthcare services: hospital beds in the general ward and intensive care unit (ICU) needed to be made available, elective surgeries were postponed, outpatient clinic appointments were adjusted, and healthcare workers were redeployed.

Operating theatre services were also restructured allowing only essential surgeries to be performed [6]. Ensuring that essential surgeries were performed while ensuring protection of healthcare staff proved to be a challenge to most healthcare institutions. The availability and proper allocation of personal protective equipment along with adequate staff training had to be addressed.

During this pandemic, elderly patients still get proximal femoral fractures making them a vulnerable group. Proximal femoral fractures in the elderly are debilitating and carries a high social and economic burden [7]. The death and disability rate due to hip fractures are substantial hence surgical treatment is recommended. Early surgery decreases risk of developing hospital-acquired pneumonia, promotes shorter hospital length of stay, and lower hospital charge [8].

This study aimed to to look at maintaining essential services for non-COVID-19 patients and to describe our experience in handling proximal femoral fractures in the elderly patients in Singapore.

METHODS

A retrospective review of surgeries involving proximal femoral fragility fractures from 1 January 2020 to 30 April 2020 within a single institution in Singapore was done. The inclusion criteria included 1) patient's 65 years old and older 2) patients who had surgery involving proximal femur. Exclusion criteria included patients 1) involving high energy trauma 2) polytrauma 3) metastatic fractures and 4) atypical fractures.

Data gathered included age, gender, type of proximal femoral fracture (neck of femur vs intertrochanteric fractures) and type of procedure performed.

Approval from local Institutional Review Board (IRB) was secured for the purpose of this study and was issued on 15 May 2020 with IRB registration number 2020/2449.

RESULTS

A total of 153 surgeries were performed on patients with proximal femoral fractures during the period reviewed. [Table I] A mean age of 82 years old (65-107 years old) with 30% (46) males and 70% (107) females. There were 48% (74) neck of femur fractures and 51% (79) intertrochanteric fractures. Among the neck of femur fractures, 68 underwent bipolar hemiarthroplasty and 6 were fixed plates and screws. Among the intertrochanteric fractures 76 underwent intramedullary nailing and 3 were fixed with plates and screws. None of the cases were COVID-19 positive.

Table I: Patient Demographic Data

Age (years)	82 (65-107)
Gender	
Male	46 (30%)
Female	107 (70%)
Neck of Femur Fractures	74 (48%)
Plates and Screw	6 (8%)
Bipolar Hemiartroplasty	68 (91%)
Intertrochanteric Fractures	79 (51%)
IM nailing	76 (96%)
Plates and Screws	3 (3%)

DISCUSSION

COVID-19 has created an unprecedented stress on health care systems worldwide. Data from EUROMOMO showed an increase in excess deaths during this COVID-19 pandemic [9]. Healthcare workers are burdened with the improving outcomes with increase in patient load as well as maintaining one's safety and wellbeing.

With overwhelming focus on handling COVID-19 cases, careful attention should be given to non-COVID-19 patients a well. Mortality from these potentially overlooked group of patients should be prevented. Resources including doctors, nurses, operating theatre and staff must be allocated to handle these cases. Our study looks at proximal femur fractures numbers during this pandemic and how its management should be maintained as an essential service.

Google mobility data reports during the COVID-19 pandemic shows that there +45% increase in residences, -62% in public transport, -62% in parks, and -62% in retail [10]. This data suggests that more people stayed in their homes during the Singapore "circuit breaker" period [10]. [Figure 2] Singapore's "circuit breaker" measures included closure of schools, workplaces and other "non-essential" services.

Retail and Recreation	**-62%**	Public Transport	**-62%**
Supermarket and Pharmacy	**-16%**	Workplaces	**-58%**
Parks	**-62 %**	Residential	**+45%**

Figure 2: Google Mobility Data accessed as of 29 May 2020

The number of hip fractures from January to April 2020 was compared to available hospital data showed that during the same period in 2017. [Figure 3]. We had 153 total hip fractures in 2020 as compared to 171 in 2017. This shows patients still present with hip fractures from falls during the "circuit breaker" period. With decreased mobility of persons, decrease outdoor activities, more people staying at home possibly providing closer supervision of elderly patients, a decrease number of patients with falls and injuries was expected. However, our current data showed that the number of patients admitted with proximal femoral fractures remain substantial.

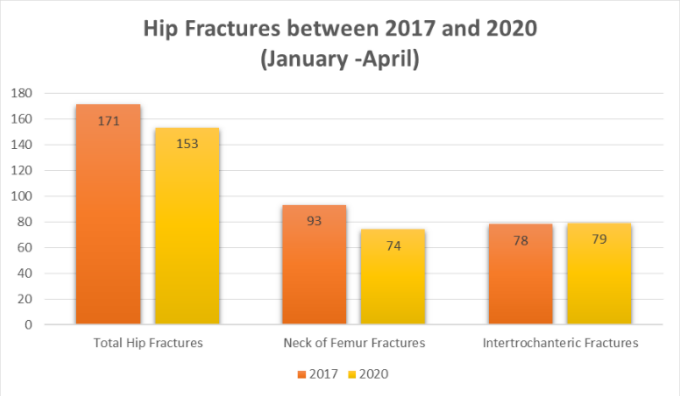

Figure 3: Comparison of Hip Fracture data between 2017 and 2020

Protection and safety of the healthcare staff should be maintained during this pandemic. This would ensure available manpower resource to care for patients coming for medical care. Our institution has adopted a COVID-19 risk category for patients going for surgery. [Figure 4] Category 1 and 2 patients are sent to a separate theatre for their procedures. The use of N95 mask, eye protection and PAPR are required for Category 1 patients whereas category 2 patients require only N95 and eye protection. Category 3 patients are done in a regular theatre with use of N95 mask and eye protection. Category 3 patients are sent to Isolation Room post-operatively and are required to be swabbed prior to de-isolation. Category 4 patients are done in a regular theatre and use of surgical mask is sufficient. This categorization serves as guideline to ensure protection of healthcare staff. In our review, our institution did not have any COVID-19 positive patients.

	Description of Cases	**Recommendations**
Category 1 -High Risk	COVID-19 positive cases Suspected Cases (Pneumonia/Respiratory Symptoms)	Procedures in segregated Theatre Use if N95, Eye Protection and PAPR
Category 2 -Moderate to High Risk	Patients on quarantine Close contact to active clusters Foreign workers	Procedure in segregated theatre Use of N95 and Eye Protection
Category 3 -Low Risk	Patients with fever with a known source	Procedures in a regular theatre Use of N95, Eye protection
Category 4 -Minimum Risk	Patients without fever, no pneumonia or respiratory symptoms	Procedures in a regular theatre Use of Surgical Mask

Figure 4: COVID-19 Risk Categories for Surgical Patients

Early surgery for hip fractures leads to early mobilization, lesser risk of chest infections and shorter hospital stay. Our institution has a Value Care Program for Hip Fractures which has enabled consistent delivery of high-quality, reliable and comprehensive evidence-based care [11]. This program facilitates holistic care of patients and assists in optimizing patients for surgery. The Value care program continued to run during this pandemic. Upon admission, hip fracture pathway is activated by the emergency room team. The orthopaedic team then clerks the patient and ensures all relevant pre-operative investigations are done. COVID risk screening is also established at this time. Patient and family discussion start at this stage and once consent for surgery is ready the patient is listed on the next available hip list. The Ortho-Geriatrics team and Anaesthesia team review patients the following day for further optimization. Our department runs a daily hip list that caters to hip fractures patients that are optimized and ready for surgery. Discharge planning involved discussion of going home versus transfer to a stepdown care facility. COVID swabs are mandatory for patients transferring to another institution such as nursing home or community hospital.

Guo *et al*. reported the incidence of infection among healthcare workers was 1.5% - 20.7% with suspected sites of exposure at general wards (79.2%), public places at the hospital (20.8%), operating rooms (12.5%), the intensive care unit (4.2%), and the outpatient clinic (4.2%) [12]. Our institution implemented safe distancing measures as well as segregation of healthcare teams. Healthcare staff were mandated to submit temperature readings twice daily to identify staff with potential infection. Requiring all staff to log in entry to hospital using SafeEntry [13] and use of TraceTogether [14] mobile applications allowed ease of contact tracing.

With reallocation of resources and well as adherence to safety measures our institution has kept surgery for proximal femoral fractures as an essential service. The methods our institution has adopted seem to be successful as none of our patients and Orthopaedic staff has been infected with COVID-19.

CONCLUSION

The COVID-19 pandemic has created a tremendous pressure on healthcare systems. While most organizations' measures are focused on handling COVID-19 cases, optimized care for elderly patients with fractures should not be overlooked. Hip fracture patients remain a vulnerable group hence their management should be continued as an essential service. Ensuring good outcomes and preventing mortality from these non-COVID-19 patients should be maintained while ensuring protection and preventing burn out of the healthcare staff. In future pandemics, preparations should be made to handle this vulnerable group of patients.

Declaration of Conflict of Interest

The authors declare that we do not have any conflict of interest.

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