



Effect of Coronavirus Disease-19 Pandemic to the Volume of Total Hip and Knee Arthroplasty Surgical Service: Experience from a Single Tertiary Orthopedic Hospital in Indonesia

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Abstract

The difficult situation of the coronavirus disease (COVID)-19 pandemic may affect to hip and knee arthroplasty service. Retrospective study was performed to patients who received elective total hip/total knee arthroplasty (THA/TKA) from January to September 2020 at Prof. Dr. R. Soeharso Orthopaedic Hospital, Surakarta, Indonesia. There were a total of 64 THA and 227 TKA from January to September of 2020. There was an extreme decrease in the number of TKA surgery during April, May, and June in 2020. The effect of coronavirus disease-19 pandemic to the decrease of arthroplasty service was mainly in the first 3 months period.

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Introduction

The COVID-19 pandemic has been affecting orthopedic services all around the world [1]. Almost all aspects of orthopedic field include emergency service, outpatient service, inpatient service, and elective surgical service, have been significantly altered [2]. Recommendations to postpone elective surgical service have been announced by the national orthopedic society to reduce the COVID-19 spreading [3]. This difficult situation of course also affects the surgical hip and knee arthroplasty service [4]. Although there has been an increasing number of arthroplasty in Indonesia in the previous year [5], the COVID-19 pandemic may also affect to hip and knee arthroplasty service in Indonesia in the recent situation.

Several authors propose some recommendations to optimize the safety of elective surgical services while limiting the spread of COVID-19 [6], [7]. The recommendation manages all aspects of the service include: patients, staff, facilities, surgery, and post-operative management [6]. Another

author also recommends an algorithm for resuming elective surgical service in the pandemic situation [7]. With the use of strict screening rules before surgery, elective surgical service may still be possible to perform. In this study, we tried to evaluate the effect of the COVID-19 pandemic to hip and knee arthroplasty surgical service in our institution.

Materials and Methods

This was a retrospective descriptive study of patients who received elective total hip/total knee arthroplasty (THA/TKA) during the period of January to September 2020 (9 months) at Prof. Dr. R. Soeharso Orthopaedic Hospital, Surakarta, Indonesia. All elective THA/TKA during the period were included in the study. We collect the demographic data, total number of surgery, number of surgery at each month, and patient's origin. We also evaluate similar data during the period

of January to September 2019 (non-pandemic period) for comparison. Further, we also evaluate trends data of THA/TKA service at our institution during the past 6 years period (2014–2019).

Pre-operative screening at the outpatient clinic was performed on all patients who will receive THA/TKA surgery includes history and clinical examination, laboratory examination, chest radiograph, rapid COVID-19 test, and polymerase chain reaction (PCR) swab test. Internist performed the decision to proceed with elective surgery at our institution. Patients with confirmed COVID-19 based on PCR swab were referred to a special referral hospital of COVID-19 for further care. There were a total of four active arthroplasty surgeons at the division of adult reconstructive surgery at our hospital: Three senior arthroplasty surgeons and one junior arthroplasty surgeon. Among the three senior arthroplasty surgeons, two are aged more than 60 years old. Posterolateral approach was the most commonly used approach for THA at our institution. Medial parapatellar approach was the most commonly used approach in TKA. We did not differentiate between primary or revision arthroplasty surgery in the data presented as the number of revision surgery was very small and predicted to have no special impact in this recent study.

Results

There were a total of 64 THA and 227 TKA from January to September of 2020. The number of TKA was increased compared to the similar period at 2019 with 175 TKA surgeries. A similar number of THA surgeries were performed in 2019 and 2020. No difference in mean of age and proportion of gender between 2019 and 2020 was found [Table 1].

Table 1: Demographic data (January–September)

Parameters	2019	2020
Mean age	57,39	58,27
Male/female	74/165	78/213

There was an increasing number of THA/TKA surgery since the past 6 years, from 2014 to 2019 at our institution (Figure 1).

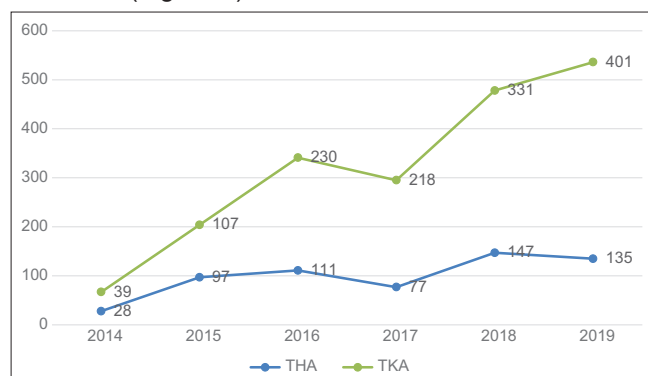


Figure 1: The trend of the total number of total hip and knee arthroplasty by year (2014–2019)

TKA was still predominantly performed surgery compared to THA. In 2019, the peak number of THA-TKA surgeries occurred in April. Conversely, there was an extreme decrease of the number of THA-TKA surgery during April, May, and June in 2020. The number of THA-TKA surgeries regaining its number from July to September 2020 (Figure 2).

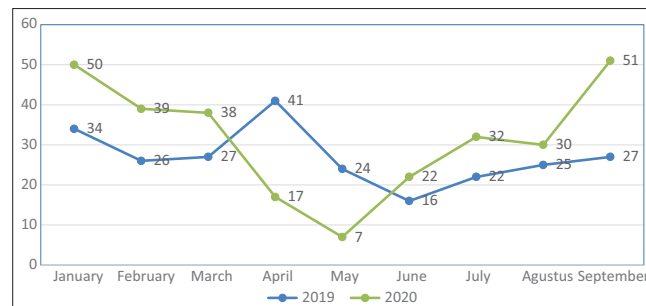


Figure 2: Comparison of total number of total hip arthroplasty during 2019 and 2020 (January–September)

There were only 13, 7, and 14 TKA during April, May, and June 2020. In comparison, the total number of TKA reaches its peak at April 2019 with 41 surgeries (Figure 3).

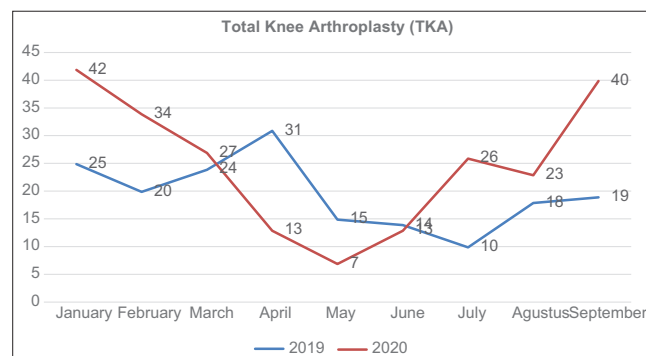


Figure 3: Comparison of the total number of TKA during 2019 and 2020 (January–September)

THA surgeries showed more fluctuated data in the number of surgeries both in 2019 and 2020. However, during the period of April and May 2020, the number of THA surgery was very small (Figure 4).

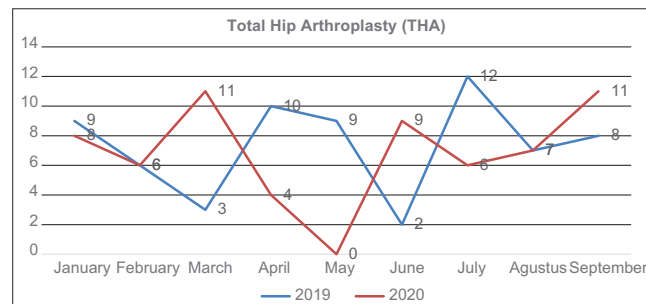


Figure 4: Comparison of the total number of total hip arthroplasty during 2019 and 2020 (January–September)

Patient's origin evaluations showed that patients who came from outside the city but still in the same province were the predominant patient's origin both in 2019 and 2020 (Figures 5 and 6). This is followed by patients who came from the outside province in early 2020 (January, February, and March). However, none of the patients come from another province in May

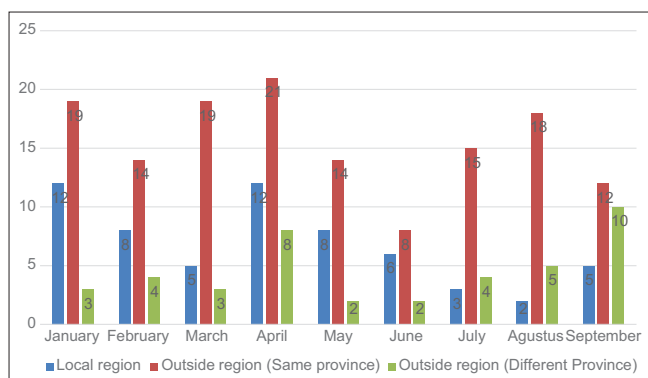


Figure 5: Origin of patients from January to September 2019

2020. Patients who come from outside of the province regain its number in July, August, and September 2020.

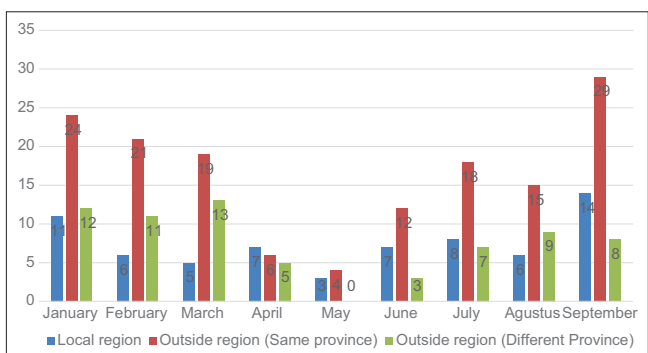


Figure 6: Origin of patients from January to September 2020

Discussion

Since the first confirmed case of COVID-19 in Indonesia in early March 2020, all aspects of medical services in Indonesia have been affected [8]. It is ranged from primary care service until surgery service [9], [10], [11]. There were several previous papers that reported the effect of the COVID-19 pandemic to THA/TKA surgical service from other countries [12], [13]. To the best of our knowledge, this is the first study to report the effect of the COVID-19 pandemic on THA/TKA surgical service in a single institution in Indonesia.

The results of this study showed that the number of THA-TKA surgeries was decreased during the early period of the pandemic, especially in the first 3 months (April, May, and June 2020). In this period, the majority of elective surgeries were canceled and rescheduled to prevent the possibility of severe acute respiratory syndrome-CoV-2 spreading. One of the senior arthroplasty surgeons who aged >60 years old was also advised to be out of duty during April, May, and June 2020 due to the previous history of health problems and categorized as high-risk personal. On the other hand, all aspects of the hospital medical service also in the phase of mitigation and preparation for the

possibility of facing the COVID-19 were fulfilled. The availability of personal protective equipment (PPE) was another difficult problem in the early phase of the pandemic in Indonesia. The price of PPE was high and difficult to find in the early period pandemic.

A study in the United States showed that patients with hip/knee arthritis suffering from the pain and continue to struggle with pain due to the disease end-stage during the COVID-19 pandemic. About 90% of patients still want to have surgery as soon as possible [14]. We found a similar situation in which the patient's expectation of receiving THA/TKA surgery was still high at our institution. As the hospital preparedness to face the pandemic situation was better compared to the first 3 months period, the number of THA-TKA surgeries was regained its number starting from July until September 2020. A complete patient screening system combined with the availability of level-3 PPE gives a perception of safety to the person involved in elective surgical service. A recent short-term study at a national referral hospital in Indonesia showed that elective orthopedic surgery might not be associated with increased cases of COVID-19 cases [9]. However, further study is needed to confirm its findings.

The decision in resuming elective surgical service, especially THA/TKA, needs a focused strategy that depends on local condition of the hospital [15]. Our hospital is not a referral hospital for COVID-19 cases. Patients with confirmed COVID-19 based on PCR swab will be referred to a referral hospital of COVID-19 for further care. Recommendations related to the safety of resuming THA/TKA surgical service have been released by several organizations [16], [17]. Several authors reported that the decrease of THA/TKA surgery volume resulted in an economic burden to all involved stakeholders includes patients, physicians, and hospitals/health-care organizations [13], [14], [15]. The burden will be higher, especially for a special orthopedic hospital like in our institution, as orthopedic service is the only core of service in the hospital. Resuming THA/TKA service may give an opportunity for economic recovery while still ensuring the safety of patients and health-care providers [18], [19].

The patient's origin is another issue to discuss in this study. We found that the patient's origin was predominantly from another city but inside the same province. The situation was similar to the previous year 2019. The government of Indonesia did not apply a total whole country "lockdown" during the COVID-19 pandemic. However, restriction of people mobilization and transportation has been applied through a more local restriction program at each city or province, namely "Pembatasan Sosial Berskala Besar (PSBB)" [20]. The program started in April 2020 in several regions of Indonesia. This also affected the number of patients who visit our institution during the same period.

There were limitations to this study. This was a descriptive retrospective study, which may have its own weakness. The data were only obtained from a single orthopedic hospital, where the local situation can be different compared to another institution, such as in a general hospital. The period of evaluation was also only 9 months and the local situation of the hospital can be dynamically change with regard to the pandemic situations. However, we believe that this study could give some insight into the early effect of COVID-19 pandemic to THA/TKA surgical service in our institution.

Conclusions

The COVID-19 pandemic has an effect on the volume of THA/TKA service at our institution. The effect was mainly in the first 3-month period. Comprehensive patient screening and complete level-3 PPE should be available before proceed to resume elective THA/TKA service.

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