The Effect of COVID-19 on Total Joint Arthroplasty

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Introduction

- Arthritis is debilitating disease that is common throughout the U.S. For patients with refractory disease, total hip and knee arthroplasty, collectively known as total joint arthroplasty, are used for definitive management.[1]
- Total joint arthroplasty, TJA, is one of the most common procedures in the U.S. and is typically inpatient in order to start physical therapy and promote joint mobility as soon as possible.
- Elective procedures, including total joint arthroplasties, were halted in March 2020 due to the pandemic.[2,3]
- When TJAs resumed they shifted towards outpatient procedures and at home physical therapy.[4]
- The impact of the COVID-19 pandemic on surgical outcomes is unknown for total joint arthroplasties.

Aims and Objectives

1. Determine the effect, if any, that COVID-19 had on surgical outcomes for total hip or knee arthroplasties
2. Examine and compare surgical outcomes for patients who had TJA before COVID-19 and during

- Achieving our aims will allow us to understand more comprehensively how COVID-19 affected surgical outcomes, if at all.
- This information could drive changes in pre- and post-operative procedures, such as length of stay after surgery or in-person versus at home physical therapy, among other things.

Methods

- This was a retrospective study comprised of patients undergoing a total hip or knee arthroplasty at Beaumont Health Royal Oak and Beaumont Health Troy
- Patients had to be greater than 18 years old and had a total hip or knee arthroplasty 4 years prior to the start of COVID-19 (4/01/2016- 3/31/2020) or within the 2 years of COVID-19 (4/01/2020-12/31/2022)
- Data was obtained from the MARQI registry which is a prospective multi-center registry of abstracted data from TJA surgery patient medical records

Results

Table 1: Surgical Outcomes for Total Knee Arthroplasty

	Pre-COVID	COVID	p-value
ED Visit, n(%)			0.0854
No	9449 (89.9%)	3846 (88.9%)	
Yes	1067 (10.1%)	480 (11.1%)	
Mortality, n(%)			0.0561
No	10502 (99.9%)	4314 (99.7%)	
Yes	14 (0.1%)	12 (0.3%)	
Readmission, n(%)			0.0119
No	9603 (91.3%)	3894 (90.0%)	
Yes	913 (8.7%)	432 (10.0%)	

Table 2: Surgical Outcomes for Total Hip Arthroplasty

	Pre-COVID	COVID	p-value
ED Visit, n(%)			0.0070
No	7239 (91.2%)	3306 (92.7%)	
Yes	698 (8.8%)	260 (7.3%)	
Mortality, n(%)			0.0439
No	7925 (99.8%)	3554 (99.7%)	
Yes	12 (0.2%)	12 (0.3%)	
Readmission, n(%)			0.0066
No	7436 (93.7%)	3292 (92.3%)	
Yes	501 (6.3%)	274 (7.7%)	

Table 1 and 2: 90-day surgical outcomes pre-COVID and during COVID. P-values derived using Chi-square test.

Table 3: Secondary Outcomes for Total Knee Arthroplasty

Procedure Status, n(%)			**p-value**
	Pre-COVID	**COVID**	<0.0001[1]
Inpatient	9293 (88.4%)	527 (19.8%)	
Outpatient	1223 (11.6%)	2141 (80.2%)	
Missing	0	1658	
Length of Stay (days)			<0.0001[2]
N	10516	4326	
Mean (SD)	2.19 (1.78)	1.48 (2.05)	
Median	2.00	1.00	
Range	0.00, 47.00	0.00, 34.00	

Table 4: Secondary Outcomes for Total Hip Arthroplasty

Procedure Status, n(%)			**p-value**
	Pre-COVID	**COVID**	<0.0001[1]
Inpatient	7738 (97.5%)	511 (22.5%)	
Outpatient	199 (2.5%)	1760 (77.5%)	
Missing	0	1295	
Length of Stay (days)			<0.0001[2]
N	7937	3566	
Mean (SD)	1.98 (2.05)	1.55 (2.10)	
Median	2.00	1.00	
Range	0.00, 100.00	0.00, 28.00	

Table 3 and 4: Procedure status and length of stay pre-COVID and during COVID. [1]P-values derived using Chi-square test. [2]P-values derived using equal variance two sample t-test

Conclusions

- Compared to pre-COVID-19 total hip and knee arthroplasties, those performed during COVID showed no significant difference in 90-day mortality, ED visits, or readmissions.
- Length of stay was significantly different for hip and knee arthroplasties during COVID-19 compared to prior and admission type shifted more towards outpatient during COVID-19
- **Limitations**: All data about procedure status is missing from 2022 total knee and hip arthroplasties
- The results support our hypothesis that surgical outcomes after total joint arthroplasty were minimally impacted by the pandemic due to increased patient screening and various precautions in place
- Shorter lengths of stay and outpatient procedures were associated with favorable surgical outcomes during COVID-19 and continuing these practices may be financially advantageous

References

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