

Assessment of Functional Recovery After Joint Replacement Surgery

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Abstract

Background: joint replacement is a surgical procedure in which an orthopedic surgeon replaces dysfunction joint with another prosthesis.

Aim: to assess the pain level and motility degree of the replaced joint at post-operative period.

Method: a retrospective cohort observational study was conducted within 3 months. It involved 27 patients who undergone to total hip arthroplasty and total knee arthroplasty. Total sampling was done. Data were collected by medical records and interview-based questionnaire and analyzed by SPSS version 27.0.

Results: For pain level, (48.1%) described very mild pain. (37%) of the patients could walk for more than 30 minutes without feeling pain. (25.9%) of them denied any hip severe sudden pain in form of shooting, stabbing or spasm, while (18.5%) had felt sometimes their knees let them down. Most of the patients had been felt slight pain when they stand up from a chair (37%). (48.1%) claimed that a little bit pain had interfered with their usual housework. (29.6%) said that they had been troubled by pain in bed at night for only one or two nights. For motility degree, (37% and 33.3%) of patients had very little trouble with washing and dryness themselves and getting in and out of the car, respectively. (33.3%) of them can put on socks, stockings or tights easily. (44.4%) could not do the household shopping at all, while (25.9%) were able to climb a flight of stairs easily. (33.3%) reported that they were limping when walking rarely. (22.2% and 22.2%) experienced a little difficulty when kneel down and get up again afterwards, and walk down a flight of stairs, respectively.

Conclusion: the majority of the patients with replaced hip and knee joints have good functional outcomes.

Keywords: arthroplasty; knee; hip; outcomes

Introduction

In orthopedic surgery, total hip and knee arthroplasty are successful and are performed in abundance [1]. They represent radical treatment lines for advanced knee and pelvic diseases in general and osteoarthritis in particular, because of their ability to improve functional aspects, relieve pain, and improve quality of life [2]. Although the impressive boom in techniques and surgical options for those problems, there are still many joint replacements that need revision [3]. Among the most common reasons for joint replacement revision are infection, aseptic loosening, and lack of stability [4-6]. With the progression of years, it is hoped that the replacement of hip and knee joints will increase at a doubling pace [7]. Although several studies have been done to assess the functional recovery after joint replacement surgery and the influencing factors, few studies have been performed in this regard in Sudan, especially during war. So, we aim to assess the functional outcomes of hip and knee arthroplasty during war. This will give responsible authorities a base that can be relied upon when applying treatment and rehabilitation plans.

Method

This study was a retrospective cohort observational hospital-based study. It was done in Osman Digna, orthopedics and trauma department. It is a governmental leading and largest teaching hospital in Port-Sudan, Red Sea state, Sudan. The target population was all orthopedics and trauma cases who undergone total hip arthroplasty and total knee arthroplasty within September.2023 to April.2024. No one was excluded. The sampling technique used was total sampling. The sample size of this study was 27 patients. The data collectors approached all subjects (n=27) using the medical records and structured interview-based questionnaire.

The questionnaire included demographic variables (age and gender), diagnosis, indication of surgery, type of joint replacement, occurrence of post-operative complications, complication identity, post-operative pain level, and range of motion of the replaced joint. The data were collected by well-trained researchers. All data that led to the identification of patients have been treated confidentially. The study purpose was explained clearly to each patient before filling the questionnaire.

The data were analyzed by Statistical Package for Social Science (SPSS) software version 27.0. Categorical variables were described statistically by frequency and percentage, while numerical variables were described statistically by mean and standard deviation or median and interquartile range according to result of normality test.

The ethical approval was held from Osman Digna teaching hospital and verbal consent was taken from the participants. Each case was informed that the data collected for this study would be used for strictly scientific purposes, and no names would appear in any stage.

Results

The study showed that the demographic features were male (48.1%) and female (51.9%) for gender distribution. While the mean age was (55 ± 15). The patients were diagnosed mainly as advanced knee osteoarthritis, and neglected head of femur fracture for (59.3% and 14.8%) respectively. (59.3%) were undergone operations for osteoarthritis. Regarding the type of arthroplasty, (59.3%) were undergone total hip arthroplasty, while (40.7%) for total knee arthroplasty. The occurrence of post-operative complications was (14.8%), and the majority of them experienced wound infection (75%).

Characteristics	Frequency	Percentage (%)
Gender		
Female	14	51.9
Male	13	48.1
Type of arthroplasty		
Total hip arthroplasty	16	59.3
Total knee arthroplasty	11	40.7
Diagnosis		
Adult hip dysplasia	1	3.7
Advanced hip/knee osteoarthritis	16	59.3
Head of femur AVN	1	3.7
Fixation failure of neck of femur fracture	1	3.7
Neglected Neck of femur fracture	1	3.7
Metal failure of hemi arthroplasty	1	3.7
Neglected posterior hip dislocation	4	14.8
Steroids induced AVN of femoral head	1	3.7
Tuberculosis of head of femur	1	3.7
Indication of joint replacement		
AVN	9	33.3
Failure of previous operations	1	3.7
Osteoarthritis	16	59.3
Painful ROM	1	3.7
Occurrence of post-operative complications		
No	23	85.2
Yes	4	14.8
The complication		
Wound infection	3	11.1
Acetabular cup malposition	1	3.7

Table-1: Sociodemographic and medical characteristics of orthopedics patients in Osman Digna hospital. (n=27)

Regarding the functional parameters of post-operative pain level, (48.1%) described very mild pain. (37%) of the patients could walk for more than 30 minutes without feeling pain. (25.9%) of them denied any hip severe sudden

pain in form of shooting, stabbing or spasm, while (18.5%) had felt sometimes their knees let them down. Most of the patients had been felt slight pain when they stand up from a chair (37%). (48.1%) claimed that a

little bit pain had interfered with their usual housework. (29.6%) said that they had been troubled by pain in bed at night for only one or two nights.

Functional measures of pain level	Frequency	Percentage (%)
How would you describe the pain you usually had from your hip?		
1 None	2	7.4
2 Very mild	13	48.1
3 Mild	7	25.9
4 Moderate	5	18.5
5 Severe	0	0
For how long have you been able to walk before the pain from your hip became severe? (with or without a stick)		
1 No pain/>30 minutes	10	37.0
2 16 to 30 minutes	8	29.6
3 5 to 15 minutes	4	14.8
4 Around the house only	4	14.8
5 Not at all	1	3.7
Have you had any sudden, severe pain - 'shooting', 'stabbing' or 'spasms' - from the affected hip?		
1 No days	7	25.9
2 Only 1 or 2 days	4	14.8
3 Some days	4	14.8
4 Most days	1	3.7
5 Every day	0	0
Not applicable	7	25.9
How much has pain from your hip interfered with your usual work (including housework)?		
1 Not at all	7	25.9
2 A little bit	13	48.1
3 Moderately	3	11.1
4 Greatly	4	14.8
5 Totally	0	0
After a meal (sat at a table), how painful has it been for you to stand up from a chair because of your hip?		
1 Not at all painful	9	33.3
2 Slightly painful	10	37.0
3 Moderately painful	7	25.9
4 Very painful	1	3.7
5 Unbearable	0	0
Have you been troubled by pain from your hip in bed at night?		
1 No nights	7	25.9
2 Only 1 or 2 nights	8	29.6
3 Some nights	7	25.9
4 Most nights	5	18.5
5 Every night	0	0
Have you felt that your knee might suddenly "give way" or let you down?		
1 Rarely/never	4	14.8
2 Sometimes or just at first	5	18.5
3 Often, not just at first	2	7.4
4 Most of the time	0	0
5 All of the time	0	0
Not applicable	16	59.3

Table-2: The functional measures of post-operative pain level of orthopedics patients in Osman Digna hospital. (n=27)

In terms of the replaced joint range of motion, (37% and 33.3%) of patients had very little trouble with washing and dryness themselves and getting in

and out of the car, respectively. (33.3%) of them can put on socks, stockings or tights easily. (44.4%) could not do the household shopping at all, while (25.9%) were able to climb a flight of stairs easily. (33.3%) reported that they

were limping when walking rarely. (22.2% and 22.2%) experienced a little difficulty when kneel down and get up again afterwards, and walk down a flight of stairs, respectively.

Functional measures of pain level	Frequency	Percentage (%)
Have you had any trouble with washing and drying yourself (all over) because of your hip?		
1 No trouble at all	5	18.5
2 Very little trouble	10	37.0
3 Moderate trouble	4	14.8
4 Extreme difficulty	8	29.6
5 Impossible to do	0	0
Have you had any trouble getting in and out of a car or using public transport because of your hip? (whichever you tend to use)		
1 No trouble at all	5	18.5
2 Very little trouble	9	33.3
3 Moderate trouble	8	29.6
4 Extreme difficulty	2	7.4
5 Impossible to do	3	11.1
Have you been able to put on a pair of socks, stockings or tights?		
1 Yes, easily	9	33.3
2 With little difficulty	1	3.7
3 With moderate difficulty	3	11.1
4 With extreme difficulty	2	7.4
5 No, impossible	1	3.7
Not applicable	11	40.7
Could you do the household shopping on your own?		
1 Yes, easily	5	18.5
2 With little difficulty	5	18.5
3 With moderate difficulty	1	3.7
4 With extreme difficulty	4	14.8
5 No, impossible	12	44.4
Have you been able to climb a flight of stairs?		
1 Yes, easily	7	25.9
2 With little difficulty	3	11.1
3 With moderate difficulty	4	14.8
4 With extreme difficulty	1	3.7
5 No, impossible	1	3.7
Not applicable	11	40.7
Have you been limping when walking, because of your hip/knee?		
1 Rarely/never	9	33.3
2 Sometimes or just at first	7	25.9
3 Often, not just at first	4	14.8
4 Most of the time	6	22.2
5 All of the time	1	3.7
Could you kneel down and get up again afterwards?		
1 Yes, easily	1	3.7
2 With little difficulty	6	22.2
3 With moderate difficulty	1	3.7
4 With extreme difficulty	2	7.4
5 No, impossible	1	3.7
Not applicable	16	59.3
Could you walk down a flight of stairs?		
1 Yes, easily	1	3.7
2 With little difficulty	6	22.2
3 With moderate difficulty	2	7.4
4 With extreme difficulty	1	3.7
5 No, impossible	1	3.7
Not applicable	16	59.3

Table-3: The functional measures of the replaced joint range of motion for orthopedics patients in Osman Digna hospital. (n=27)

Discussion

In the context of many previous studies that have been concerned with

evaluating functional outcomes of joint replacement surgery for lower limbs, our study is characterized by that it was carried out in a difficult period sweeping the country that would affect surgical outcomes in general and

orthopedic surgery in particular.

Sociodemographic characteristics stipulated female's superiority at an average age of 55 years. Surgical features suggested that the majority were diagnosed with advanced osteoarthritis and neglected head of femur fracture. We limited our study to the lower extremities specifically pelvis and knee joint arthroplasty. In terms of post-operative complications, fortunately a small proportion were exposed to them, and the majority of whom suffered from wound infection.

When addressing the study's main findings, many patients experienced post-operative pain in varying proportions. However, we can describe the state of pain to these patients that about half of them have very slight pain, and many of them have been able to walk for more than 30 minutes without feeling pain. Although a quarter didn't feel any sudden severe pain in the form of a stabbing, shooting or spasm. About a fifth of the patients felt at times that their knees exposed them to repeated falls. The majority of patients stated that they feel mild pain when standing from a chair, and that this pain is inconsistent with doing usual daily housework. Also, an estimated percentage of them claimed to feel a pain that would spark their sleep for one or two nights. Compared to another study, just over a third experienced post-operative pain for more than 4 weeks. The average time it took for patients to walk independently and do household works without feeling pain was 12 days and 49 days, respectively. [8] In total, we can observe convergence in some measures especially regarding the possibility of walking borderless and doing household work. It took a relatively short period in the first, and a longer period in the second with the possibility of measures improvement over time. In contrast, the two studies differ in terms of the feeling of pain after the operation, in the comparison study a slightly higher percentage of pain after the operation for a time exceeding 4 weeks. This difference can be attributed to the age targeted by the research, where the mean age was 75, and age is one of the key factors influencing the functional outcomes of joints that have been replaced. [9]

Regarding the range of motion of the replaced joints, the general description of the movement picture after pelvis and knee replacement is that more than a third of patients experienced negligible difficulties when doing daily personal activity such as washing and drying themselves, wearing socks, and when riding and getting out from various means of transportation such as a car. The same proportion also suffered from limping when walking rarely. Almost a quarter of those patients can climb the stairs very easily. They also have a slight difficulty in sitting and standing up or coming down the stairs. However, an estimated percentage of them can't afford to buy their household needs on their own at all. Our findings are inconsistent with what is stated in this study, which states that approximately one fifth of those patients after six months of joint arthroplasty felt moderate to severe pain, and that the longest time they can walk without any difficulty is only 15 minutes with a motion range not exceeding 90 degrees. [10] Also, this difference is due to the different mean age of the participants and the predominant gender. Their mean age was 68 years and most were women. These factors play an active role in the decline of range of motion after joints arthroplasty. [11-12]

The findings of this study can be exploited to improve treatment and rehabilitation plans that result in advance of functional outcomes for replacement of lower limb joints, especially the pelvis and knee. The strengths and weaknesses of this study are a double-edged weapon. It was conducted in a period of war that would negatively affect outcomes. In contrast, security control in this period can limit accessing and collecting data. In addition, most of the data relied upon in the study were manual medical records that may contain errors or inaccuracy. Accordingly, researchers on the same discipline in the future should assess functional outcomes in other research methods such as clinical audits.

Conclusion

Joint arthroplasty is a durable, effective therapeutic surgical method that

some factors may limit its effectiveness. Therefore, the responsible authorities should emphasize the importance of this surgery and improve all its aspects.

References

1. Learmonth I. D., Young C., and Rorabeck C., The operation of the century: total hip replacement, *The Lancet*. (2007) 370, 1508–1519, [https://doi.org/10.1016/S0140-6736\(07\)60457-7](https://doi.org/10.1016/S0140-6736(07)60457-7), 2-s2.0-35448944365.
2. Hawker G., Wright J., Coyte P., Paul J., Dittus R., Croxford R., Katz B., Bombardier C., Heck D., and Freund D., Health-related quality of life after knee replacement, *The Journal of Bone & Joint Surgery*. (1998) 80, no. 2, 163–173, <https://doi.org/10.2106/00004623-199802000-00003>, 2-s2.0-0031890103.
3. Ong K. L., Mowat F. S., Chan N., Lau E., Halpern M. T., and Kurtz S. M., Economic burden of revision hip and knee arthroplasty in medicare enrollees, *Clinical Orthopaedics and Related Research*. (2006) no. 446, 22–28, 2-s2.0-33744727673, <https://doi.org/10.1097/01.blo.0000214439.95268.59>.
4. Kurtz S., Ong K., Lau E., Mowat F., and Halpern M., Projections of primary and revision hip and knee arthroplasty in the United States from 2005 to 2030, *The Journal of Bone & Joint Surgery*. (2007) 89, no. 4, 780–785, <https://doi.org/10.2106/jbjs.f.00222>, 2-s2.0-34147150632.
5. Bozic K. J., Kurtz S. M., Lau E., Ong K., Vail D. T. P., and Berry D. J., The epidemiology of revision total hip arthroplasty in the united states, *The Journal of Bone & Joint Surgery*. (2009) 91, no. 1, 128–133, <https://doi.org/10.2106/jbjs.h.00155>, 2-s2.0-58649122701.
6. Gwam C. U., Mistry J. B., Mohamed N. S., Thomas M., Bigart K. C., Mont M. A., and Delanois R. E., Current Epidemiology of Revision Total Hip Arthroplasty in the United States: National Inpatient Sample 2009 to 2013, *The Journal of Arthroplasty*. (2017) 32, no. 7, 2088–2092, 2-s2.0-85015761497, <https://doi.org/10.1016/j.arth.2017.02.046>.
7. Palit A., Williams M. A., Turley G. A., Renkawitz T., and Weber M., Femur First navigation can reduce impingement severity compared to traditional free hand total hip arthroplasty, *Scientific Reports*. (2017) 7, article no. 7238, no. 1, 2-s2.0-85026865378.
8. Hamel MB, Toth M, Legedza A, Rosen MP. Joint replacement surgery in elderly patients with severe osteoarthritis of the hip or knee: decision making, postoperative recovery, and clinical outcomes. *Archives of internal medicine*. 2008 Jul 14;168(13):1430-40.
9. Wainwright C, Theis JC, Garneti N, Melloh M. Age at hip or knee joint replacement surgery predicts likelihood of revision surgery. *The Journal of Bone & Joint Surgery British Volume*. 2011 Oct 1;93(10):1411-5.
10. Pua YH, Poon CL, Seah FJ, Thumboo J, Clark RA, Tan MH, Chong HC, Tan JW, Chew ES, Yeo SJ. Predicting individual knee range of motion, knee pain, and walking limitation outcomes following total knee arthroplasty. *Acta Orthopaedica*. 2019 Mar 4;90(2):179-86.
11. Parsley BS, Bertolusso R, Harrington M, Brekke A, Noble PC. Influence of gender on age of treatment with TKA and functional outcome. *Clinical Orthopaedics and Related Research*. 2010 Jul;468:1759-64.
12. Farahini H, Moghtadaei M, Bagheri A, Akbarian E. Factors influencing range of motion after total knee arthroplasty. *Iranian red crescent medical journal*. 2012 Jul;14(7):417.



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