

Original Article

Morbidity index: A score to assess immediate postoperative recovery in TKR patients

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ABSTRACT

Background: Every surgical procedure involves certain amount of postoperative morbidity which varies among different surgeries and the same surgery done by different techniques. Minimally invasive surgeries have evolved in all surgical branches and are believed to have a lesser morbidity than the traditional procedures; however there is no score or index to assess the immediate recovery after any surgical procedure in the literature. We tried to devise an immediate postoperative assessment method that takes into account the early recovery phase of patient post total knee arthroplasty (TKA) from day 1 to day 3. We called it as morbidity index. It consists of a 10 different parameters which could overall assess the patient's postoperative recovery.

Materials & methods: A prospective study was conducted in order to evaluate feasibility of the morbidity index and its usefulness in assessing the immediate postoperative recovery in TKA. We evaluated 50 consecutive TKA patients and scored at day 1, day 2 and day 3 postoperatively by a morbidity index. **Results:** The mean score on day one was 13.88 which decreased to 4.68 by day three indicating morbidity has decreased.

Conclusions: The morbidity index can be a tool to assess the immediate postoperative recovery of the patient after TKA and can be used to compare different approaches and procedure.

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1. Introduction

Every surgical procedure involves certain amount of postoperative morbidity which varies among different surgeries and the same surgery done by different techniques. Minimally invasive surgeries have evolved in all surgical branches and are believed to have a lesser morbidity than the traditional procedures; however there is no score or index to assess the immediate recovery after any surgical procedure in the literature. Total knee arthroplasty (TKA) is not an exception. The commonly used knee scores for example the WOMAC (Western Ontario and Mc Master Universities Index) and Oxford knee scores only assess the long-term results of TKR.^{1–3} Furthermore the patients' expectation varies from surgeons' expectation and cannot be reflected in these scores. The patient wants a pain free, good functioning knee and ambulate early without complications and the surgeon concentrates on

alignment, range of motion and wound recovery along with systemic status of the patient.

We have tried to devise an immediate postoperative assessment method and called it the morbidity index that takes into account the early recovery phase of patient from day 1 to day 3 postoperatively.

2. Materials and methods

A prospective study was conducted in order to evaluate feasibility the morbidity index and its usefulness in assessing the immediate postoperative recovery in TKR patients. 50 consecutive TKA patients were included in our study who were ready to give consent. The patients were operated by senior author using subvastus approach. The men age was 62 (range 45–80 years) with 45 females and 5 males. 19 patients were not having any co morbidity, 8 were diabetics, 14 were hypertensive and 9 had both diabetes and hypertension. All the patients were operated under spinal anesthesia only and femoral block was given postoperatively and the femoral catheter was removed on day 1 postoperatively. Tourniquet was not used. Tranexamic acid in a dose of 15 mg/kg was given 30 min prior to surgery and two doses of 10 mg/kg were

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Table 1
Morbidity index.

Sr No.	Activities	Score 0	Score 1	Score 2	Score 3
1	Knee ROM	No extensor lag, Flexion > 90	Lag < 10 Flexion 60–90	Lag > 10 < 20 Flexion 30–60	Lag > 20 Flexion < 30
2	Power	Can do active SLR	Can do active SLR but cannot sustain for more than 5 s	Needs initial support for active SLR	Cannot do active SLR
3	Ambulation	Able to walk independently	Able to walk with stick	Able to walk with walker	Unable to stand
4	Pain	Mild or no pain	Pain tolerable with oral medications	Requires systemic medications to control pain	Severe pain despite of systemic medications
5	Wound status	Clean	Mild spotting	Minimal soakage or Drain <300 over 24 h	Complete soakage or Drain >300 over 24 h
6	Bladder	Can pass urine comfortably	Frequency but no retention	Less control and incomplete emptying	Require catheterization
7	Vital signs	Pulse and BP stable and input and output maintained	Needs mild support. Not affecting mobilisation	Needs more support severe enough to affect mobilisation	Needs continual support (ICU)
8	Attitude	Happy	Enthusiastic but anxious	Concerned	Unhappy
9	Sleep	Sleeping well	Sleep less than normal	Sleep with help of sedatives	Could not sleep even with sedatives
10	Appetite	Normal	Less	Loss of appetite with nausea and vomiting	Severe anorexia

given 3 h and 6 h post surgery.⁴ No patient was catheterized preoperatively. TED stockings were given postoperatively to all patients. The patients were assessed with morbidity scoring system (morbidity index) on postoperative day1, day 2 and day 3. It consists of 10 parameters which takes into account general, systemic, psychological and knee specific factors. All the 10 parameters are graded on a scale of 0–3 points. The minimum score is 0 and maximum is 30. Lower score indicates less morbidity (Table 1). Scores in the range 0–10 considered as excellent, 11–20 considered as good and 21–30 considered as poor results.

3. Results

The mean score on day one was 13.88 which decreased to 4.68 by day three indicating morbidity has decreased. On postoperative day three 96% (n=48) patients had excellent results, 4% (n=2) patients had good result and none of the patient had poor result (Fig. 1).

4. Discussion

Total knee replacement involves significant immediate post-operative morbidity which has direct influence on early postoperative rehabilitation. Various factors affect the rate of immediate as well as long term recovery, such as patient selection, preoperative education, surgical technique, pain management, and postoperative rehabilitation.⁵ Minimally invasive surgical approaches are evolving in all surgical branches and are believed to have a lesser morbidity than the traditional approaches; however there is no score or index to assess the immediate recovery after any surgical procedure hence to compare different surgical techniques and approaches. The WOMAC (Western Ontario and Mc Master Universities Index) and the Oxford Scores include only the functional abilities to carry out certain activities of the operated

knee but does not include other parameters of recovery such as wound status, bladder activity, sleep, appetite, mental status and so on. Furthermore, these scores are not applicable on early postoperative day.

We have devised a scoring system to assess the immediate recovery of the patients after TKR that includes various parameters and activities related to the early rehabilitation. The average score on day 1 was 13.38, came to 9.22 on day 2 and became 4.68 on day 3 (Table 2) showing decreasing trend indicating patient becoming lesser morbid by day 3 and able to manage himself independently. On postoperative day one, 7 patients have scored less than 10 points and 41 patients scored between 11 and 20 points. Rest 2 patients scored between 21 and 30 points. On day two and day 3 no patients scored above 20 points suggesting that most of the patients were mobile and were independently doing their routine day-to-day activities after day two. As extensor apparatus was preserved in our minimally invasive approach almost 50 percent of the patients were able to do active SLR by the day one and the remaining could achieve it by day three. Almost 80 percent of the patients could extend the knees with around 5–10° lag on day one and were able to flex up to 60–90° on day one. Of the 50 patients 46 patients were able to do assisted walking with walker by day one. 33 patients had mild to moderate pain on day one and 16 patients had moderate to severe pain which was under control with analgesics. Postoperative femoral block was given to every patient and the femoral catheter was removed on day one after injecting 25% sensoricaine. Only 2 patients required additional dose of intravenous analgesia otherwise the pain was tolerable. One patient required intensive monitoring in ICU as left ventricular ejection fraction was low (45%). Rest all patients were stable. About 70 percent of the patients were able to pass urine on their own within 5–6 h of surgery. 3 patients required catheterization for retention, as urine retention is a known complication of spinal anesthesia. No patient was catheterized preoperatively. Regarding dressing status of the patients, dressings were changed on day one after which there was no further dressing unless it became soaked (in 2 patients). Rest all the patients had completely dry dressing or mild spotting. 46 patients were having normal diet from day one

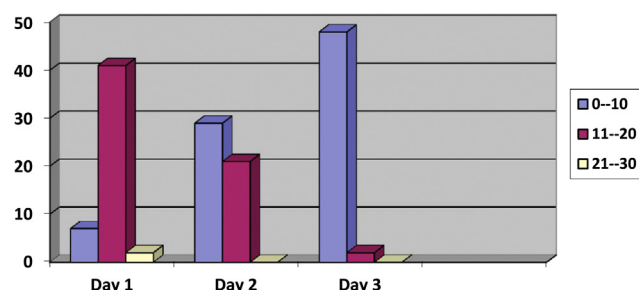


Fig. 1. Morbidity scores on day 1,2,3.

Table 2
Morbidity score on day 1,2,3.

Score	Postop day 1 (no. of patients)	Postop day 2 (no. of patients)	Postop day 3 (no. of patients)
0–10 (Excellent)	7	29	48
11–20 (Good)	41	21	2
21–30 (Poor)	2	0	0

and were able to ambulate independently and were able to sleep well from day one, they were mentally happy for their outcome. Rests 4 of the patients had concerns of pain, sleep and urinary retention and were enthusiastic about the outcome. The score serves as a tool for assessing the mental and physical status of the patients thereby quantifying the recovery status.

There are few studies in literature assessing early recovery post surgery comparing different surgical approaches.⁶ However we could not identify similar score or any index in the literature assessing or quantifying immediate recovery of the patients posts TKR. It is simple and objective and requires hardly 10–15 min for completion. The limitation of the study could be that the cases were operated by single surgeon at a single center so validity of the score is yet to determine. As this was the first study of its kind it may need further improvisation in accuracy and validity of score and may include further aspects related to recovery of the patient.

5. Conclusion

Morbidity index can serve as a reliable tool to assess the immediate recovery post TKR and to determine optimal time to discharge the patient from hospital. The index can also be used to

compare the various surgical approaches and techniques so as to constantly improve patient and surgeon satisfaction.

Conflicts of interest

All authors have none to declare.

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