

Cost effectiveness of local anesthesia in knee arthroscopy

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Abstract

Objective: The objective of this study is to evaluate the cost and time effectiveness for local and general anesthesia methods when performing knee arthroscopy.

Material and methods: This descriptive study was conducted on 60 consecutive patients in Orthopedic Department of Hayatabad Medical Complex Peshawar from October 2005 to September 2009. Knee arthroscopy was done under local anesthesia in 30 patients and under general anesthesia in other 30 patients. Patients of any sex and above 18 years were included while Patients with neoplasm, inflammatory or infectious disorders or history of surgeries and subsequent metal implants of any type were excluded from the study. After the procedure total anesthesia time, surgery time, recovery time, cost of the anesthesia and total hospital stay in both categories was calculated and analyzed with the help of SPSS version 10.

Results: There were 40 male and 20 female patients with average age of 33 years. The minimum time of surgery was 60, maximum 120 and average was 90 minutes in both groups. Average hospital stay for GA group was 2 days while for LA group it was 1 day average. Immediately after local anesthesia all of the patients were able to actively move their operated limb while full recovery from general anesthesia took three hours on average. For GA group the average total cost- that includes anesthesia charges- was Rs 3232/- and for hepatitis patients it was Rs 5532/- while for LA group the total average charges were the same.

Conclusion: Knee arthroscopy under local anesthesia is cost effective with low complication rate and can be done without the help of anesthetist.⁸

Keywords: Local Anesthesia, General Anesthesia, Arthroscopy, Cost effectiveness.

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Introduction:

Knee arthroscopy is a surgical procedure in which orthopaedic surgeons use to visualize, diagnose and treat diseases inside a joint¹. It has always been considered as a gold standard and valuable tool in diagnosing meniscal injuries and other lesions in knee joint.² In arthroscopy, a type of endoscope (arthroscope) is inserted into the joint through a stab incision. Arthroscopic procedures can be performed either to evaluate or to treat many orthopaedic conditions including torn floating cartilage, torn surface cartilage, anterior cruciate ligament (ACL) reconstruction, and trimming of damaged cartilage³. The magnetic resonance imaging (MRI) examina-

tion techniques recommended in the literature at present are not able to replace the arthroscopy for the diagnosis of cartilage damages of the knee joint.⁴ Arthroscopy still has to be seen as the method of choice for the evaluation of cartilage damage.⁵

Although arthroscopic surgery has received a lot of public attention because it is used to treat well-known athletes, it is an extremely valuable tool for all orthopaedic patients and is generally easier than "open" surgery.⁶ Most patients have their arthroscopic surgery as outpatients and can go home within two to three hours after the surgery.⁶

Arthroscopy can be done under local (LA), spinal (SA) and general anesthesia (GA). General as well as spinal anesthesia has higher complication rate as compared to local anesthesia and currently local anesthesia is the favored anesthesia all over the world⁷. Local anesthesia has the added benefit being low cost anesthesia that can be given without the help of anesthetist.⁸

The objective of this study is to evaluate the cost effectiveness for local and general anesthesia methods when performing knee arthroscopy.

Material and methods:

This descriptive study was conducted on 60 consecutive patients in Orthopedic Department of Hayatabad Medical Complex Peshawar from October 2005 to September 2009. For easiness we labeled the patients as LA group for local anesthesia and GA group for general anesthesia.

Inclusion criteria

- All patients with history of trauma and knee joint pain, those are;
- Above 18 years of age
- Any sex
- Willing to be included in the study

Exclusion criteria:

- Patients with neoplasm, inflammatory or infectious disorders
- Patients with history of surgeries and subsequent metal implants of any type.

After fitting into the inclusion criterion, a thorough history was elucidated, complete physical examination performed and investigations carried out. All the patients were counseled about their conditions and informed consent was taken from them. Preoperative Cefuroxime 1.5 gram was given. In LA group, under aseptic conditions, 30 milliliter (ml) (150 mg) of Bupivacaine (Abocaine; Abbott) was injected into the knee joint by the surgeon before washing up. The patient was then draped aseptically. Skin portal were infiltrated separately with 2% lignocaine with adrenalin 1:200,000 (Xylocaine; GSK) 5 ml at each skin portal upto the joint capsule. In GA group the standard protocol of general anes-

thesia by anesthetist was followed.

Then total anesthesia time, surgery time, recovery time, cost of the anesthesia and total hospital stay in both categories was calculated and analyzed with the help of SPSS version 10.

Results:

Sixty patients were included in this study, amongst them 40 were male and 20 were female. Average age of the patients was 33, Maximum age was 60 and minimum ages 15 years. Right knee was involved in 36 patients and left in 24. Arthroscopy was done under local anesthesia (LA) in 30 patients and the other 30 cases were arthroscoped under general anesthesia (GA). The arthroscopic findings in both groups were osteoarthritis in 36(60%), synovitis in 30(50%) patients, medial meniscal tear in 28(46.66%), lateral meniscal tear in 20(33.33%), ACL tear in 14(23.33%) and loose bodies in 10(16.66%) patients. (Table No 1)

The minimum surgery time was 60, maximum 120 and average was 90 minutes in both groups. Minimum hospital stay for GA group was 1 day maximum 4 days and average was 2 days while for LA group it was 12 hours minimum, 2 days maximum and 1 day average. Immediately after local anesthesia all of the patients were able to actively move their operated limb while full recovery from general anesthesia took three hours on average. (Table No 2)

Average cost of anesthesia medication for local anesthesia was Rs165/-, for general anesthesia Rs 732/- (1: 4.5) and for hepatitis patients the total cost of GA medication was Rs 3032/- (1: 18). For GA group the average total cost- that

Table 1: Arthroscopic findings (N=60)

Procedures	No. of Cases	Percentage
Osteoarthritis	36	60
Synovitis	30	50
Medial meniscus tear	28	46.66
Lateral meniscus tear	20	33.33
ACL tear	14	23.33
61-70 years	02	8.7
Loose bodies	10	16.66

includes anesthesia charges- was Rs 3232/- and for hepatitis patients it was Rs 5532/- while for LA group the total average charges were the same (Rs 165/-).(Table No 2)

There was no complication in immediate post-operative follow up.

Discussion:

Diagnosing joint injuries and disease begins with a thorough medical history, physical examination, and usually X-rays. Additional tests such as magnetic resonance imaging (MRI) or computed tomography (CT) scan also may be needed, but the final diagnosis is made through the arthroscope, which may be more accurate than through “open” surgery or from X-ray studies.⁶ Arthroscopy under local anesthesia is the gold standard throughout the world but general anesthesia is also implied.⁸

Triesmann H W⁹ had compared local anesthesia with general anesthesia and pointed out that local anesthesia was associated with an average reduction in overall charges of \$600 per arthroscopy compared with general anesthesia. Swiniarski D et al¹⁰ done 520 arthroscopies under local anesthesia had shown the savings of more than 40 % as compared to general anesthesia.

Forsblad M et al¹¹ study shows that the use of LA was shown to save SEK (Swedish Crowns) 1011 per patient compared to SA and GA. The total hospital time in the GA group was also longer than that of LA group.¹¹ The time from start of anesthesia to start of surgery was significantly longer in the LA group as well as the recovery time, compared to the GA group. There were

no differences in the surgery time for the two groups¹¹. In our study the total cost of anesthesia medication for local anesthesia was Rs165/-, for general anesthesia Rs 3232/- and for hepatitis patients the total cost of GA medication was Rs 5532/-. Our study is consistent with the study of Forsblad M et al¹¹ in comparing the time of surgery. Also our study is comparable with Triesmann HW⁹, Swiniarski D et al¹⁰ and Lintner S et al¹² studies for low cost of local anesthesia. Lintner S et al¹² study also show that there were 19 complications with general anesthesia, 16 with regional anesthesia, and 2 with local anesthesia while in our study there was no complication noted in local anesthesia. In our study while performing arthroscopy under LA no anaesthesiological assistance was needed and all the thirty arthroscopies were done independently.

Munk S et al¹⁴ was also of the opinion that arthroscopy of the knee can be performed in local anaesthesia without anesthesiological assistance. He also recommends that arthroscopy of the knee in local anaesthesia is planned without anaesthesiological assistance.

Conclusion:

Knee arthroscopies can be performed as safely and effectively under local anesthesia as under any other form of anesthesia due to less cost both for the patient and hospital and less complications. For most patients, local anesthesia can be recommended as the standard procedure for outpatient knee arthroscopy.¹⁵

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Table 2: Cost, Hospital Stay, Anesthesia Time, Surgery Time and Recovery Time (n=60)

Variables	LA	GA
Cost of Anesthesia		
Cost of medication	Rs.165/-	Rs.732/- (Rs.3032/-*)
Anesthesia charges	0	Rs.2500/-
Total	Rs.165/-	Rs.3232/- (Rs.5532/-*)
Total hospital stay (average)	1day (Rs. 1200/-)	2 days (Rs. 2400/-)
Anesthesia time(average)	6 hours	2 hours
Surgery time(average)	90 minutes	90 minutes
Recovery time(average)	Immediate	Three hours

* Cost of GA in Hepatitis B/C Positive Patients

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