

## Study of Efficacy of Extraosseous Local Infiltration of Multimodal Drug Cocktail for Pain Management after Total Joint Arthroplasty in Lower Limb

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### ABSTRACT

**Background:** Postoperative pain, through diminished patient satisfaction and prolonged rehabilitation, may have a significant impact on patient recovery. While pain is inevitable part of post-operative period, it is relevant common to have insufficient pain control which can have profound consequences. Post-operative pain has been a continuous struggle for health care, despite guidance and recommendations from pain management societies. Total joint arthroplasty is currently a potential treatment for severe arthritis, although post-operative pain control remains a concern. This study will compare two analgesic techniques (epidural infiltration and extraosseous infiltration) in terms of analgesic impact (as measured by the VAS score), early motor activities, and pain relief period duration after total joint arthroplasty, as well as drug safety.

**Aim:** Study the effect of extraosseous local infiltration of multimodal drug for post-operative pain management after total joint arthroplasty in lower limb.

**Objective:** To compare the effect of epidural analgesia *versus* multimodal drug cocktail for pain relief in post-operative period and also to study comfort of patients in terms of walking distance, hip and knee range of movements in post-operative period.

**Material and methods:** Adults coming to Department of orthopedics with advanced osteoarthritis of hip, knee and who will undergo arthroplasty surgery will be divided into 2 groups. Out of these 2 groups one group will be given multimodal cocktail infiltration locally and epidural analgesia with no infiltration in the other group of individuals.

**Expected results:** The pain control and relief in extra osseous cocktail injection group will be slightly better compared to epidural infiltration group post-operatively. The Post-operative period will be of longer duration in the patients receiving cocktail infiltration without any additional dosages to be received.

**Keywords:** Post-operative pain; Arthroplasty; Local infiltration analgesia

## INTRODUCTION

Although the term "osteoarthritis" is not a good one (especially the use of "itis"), it is still used today, and we are gradually learning that it is not entirely incorrect. A number of experts have suggested that instead of using the suffix "itis" to show inflammatory pathology, alternative terms such as osteoarthritis or degenerative joint disease are used to describe the age-related mechanical degeneration of joints. Although arthritis refers to inflammation of a diarthrodial (synovial membrane-lined) joint,

there is no inflammation in osteoarthritis. However, as understanding progresses, a number of inflammatory mediators involved for the development of this illness are being identified, therefore osteoarthritis may not be entirely incorrect. Despite the fact that arthritis refers to inflammation of a diarthrodial (synovial membrane-lined) joint, osteoarthritis does not involve inflammation. However, as knowledge of the disease grows, a variety of inflammatory mediators associated in its development are being found, therefore osteoarthritis may not be wholly

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inaccurate. As a degenerative condition, osteoarthritis causes chronic pain and functional disabilities that can lead to impairment and poor quality of life [1-3]. Osteoarthritis cause damage and destruction of the articular cartilage, it also causes sub-articular bone remodeling, formation of osteophytes, ligaments to undergo laxity, peri articular muscle weakness alongside synovial inflammation.

### Prevalence of osteoarthritis

A recent systematic review attempted to uncover the reasons behind the disparities in prevalence. Regarding the prevalence of Osteoarthritis in the knee, hip, and hand and wrist joints, according to case definition. The greatest estimates were obtained using the radiographic case definition, but self-reported and symptomatic OA criteria yielded similar results.

## MATERIALS AND METHODS

### Indications for total joint arthroplasty

Total Joint Arthroplasty is a safe and efficient surgical procedure for patients having grade-4 arthritis to alleviate discomfort, regain functions and improve the quality of life linked to health. Reduced joint pain, increased joint mobility and movement, correction of deformities, limb length equalization (not guaranteed), increased leg muscle strength, improved quality of life, and the ability to return to everyday activities are all benefits of arthroplasty. It's for people who have pain, impairment, or reduced function due to osteoarthritis, RA, or any type of arthritic deformity around the knee/hip joint. Reduction of discomfort, return to daily activities, mechanical alignment, preservation of the joint line, and ligament balancing are all goals of total joint arthroplasty.

### Pain management post total joint arthroplasty

However, regardless of the type of arthroplasty performed, extreme postoperative pain has generally been associated with this surgery. Total joint arthroplasty is a surgical procedure that is inherently painful. It's critical to manage pain after a knee replacement if you want to improve your function and heal faster. With this in mind, it's crucial to remember that everyone suffers varying levels of pain after surgery, and that even within that range, there's a wide range of outcomes can be interpreted in a variety of ways by various people. Up to 60% of patients with complete joint arthroplasty have severe post-operative pain complaints and another 30% have mild pain complaints [4,5]. This can lead to excruciating pain; patient dissatisfaction contributes to poor surgery outcomes and a longer recovery period. Therefore, in today's result-based patient care, maximizing pain management for patients who will undergo complete joint arthroplasty is mandatory for patient well-being. For early recovery and improved functional performance, successful management of postoperative pain is important. Early post-operative pain management, however, is critical in shorter hospital stays, increasing patient satisfaction with enhanced

recovery. To regulate pain, numerous procedures are used, including continuous epidural anesthesia, local infiltration anesthesia, peripheral nerve block [6-8].

Patient satisfaction suffers as a result of postoperative pain, and recuperation takes longer and longer rehabilitation period, may have a significant impact on patient recovery. While pain is an unavoidable aspect of the post-operative experience, it is common to have insufficient pain control which can have profound consequences. Despite guidance and suggestions from pain management groups, post-operative pain is still seen as a serious health-care issue [9,10].

### Epidural analgesia

The use of epidural anesthesia as a supplement to general anesthesia is common. This is most typically utilized when both knees are replaced at the same time, though it is becoming less common as anesthesiologists improve their adductor canal blocks. An epidural anesthetic has the advantage of leaving a catheter in place, which makes it easy to top up and can be used for up to three days after surgery [11-14]. The disadvantages stem from the difficulty of insertion and the lack of consistency. Epidural anesthesia gives excellent pain relief when used properly. Epidural anesthesia, on the other hand, has a reputation for being unreliable. It usually affects one leg more than the other, and spreading it to the side where it is needed can be challenging. To try to remedy the spread and get the anesthetic to where it's needed, you might have to roll to the side for a moment to allow the anesthetic to go across the space.

### Periarticular injection

Periarticular injection with long-acting liposomal bupivacaine is an efficient way to reduce preoperative discomfort after total hip/knee arthroplasty in lower limb. While reducing opiate intake and side effects. It has the potential to improve muscle control during recovery while avoiding the side effects of opiates and peripheral nerve blocking. To avoid leaking from the soft tissues, the infiltration method must be carefully monitored, and intravascular injection should be avoided. To get the most out of periarticular injection, concentrate the Peri articular injection on areas of the knee and hip with more innervation. This can help with postoperative pain control after total joint arthroplasty.

### Osteoarthritis epidemiology

The majority of adults over the age of 60 have signs of OA in at least one joint, with radiological evidence in 70% of hips and knees in those over the age of 65. The frequency is 10% among 60-year-olds and rises with age; by 2020, the overall number of people affected will have doubled [15]. OA is the fourth greatest cause of non-fatal health problems, accounting for 3% of all years spent disabled. Knee osteoarthritis is one of the common

and debilitating types of Osteoarthritis. Because of the growing old population and the obesity epidemic, the prevalence of OA is rising in India as described in Table 1.

Reference	No. of patients	Age (years)	Gender	Symptoms
Bonjardim et al. [16]	196	18-25	Male and Female	Moderate to severe TMD (9%)
Taneja et al. [17]	132	12-15	Male and Female	Moderate to severe TMD (19%)

**Table 1:** Prevalence and epidemiology of Temporomandibular Disorders (TMD) among general population of India.

## RESULTS AND DISCUSSION

Unfortunately, each of the 27 trials had flaws in the therapy, follow up, or both, making the results hard to repeat. For a brief time, steroid therapy (intrathecal) was popular, but high complication rates, such as arachnoiditis and, less frequently, meningitis, led to a return to epidural anesthesia therapy for sciatica in the 1970s. Steroids have traditionally been injected caudally and inter-laminarly into the posterior epidural space, although small amount peri-neural (transforaminal) epidural injections into the anterior or the lateral epidural space for steroid implantation have recently become more popular. There is no confirmation that systemic steroids can help with pain from the spine. About anesthetic options available for intraoperative and post-operative pain control Spinal/epidural anesthesia tends to be less of a systemic risk than the general one. Although continuous epidural analgesia has been found to be helpful, it is accompanied with adverse effects such as post puncture headaches, neurogenic bladder, intra operative hypotension, respiratory depression, pulmonary hypertension, cardiac decompensation, the risk of spinal infection, nausea, and vomiting.

## CONCLUSION

Although total joint arthroplasties are well-known for their success, they are frequently linked with lengthy and painful recovery periods. In recent years, significant progress has been achieved in reducing patient suffering and improving recovery. Less invasive surgical techniques, more selective soft tissue balance, increased patient education, and maybe enhanced tool and implant design have all contributed to a patient's overall rehabilitation after Total joint Arthroplasty. Improvements in pain control, on the other hand, deserve the most credit for the more speedy recoveries that are currently being observed. Periarticular injections of long-acting liposomal bupivacaine are an excellent way to reduce postoperative pain following Total joint arthroplasty and while also reducing opiate intake and side effects.

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