Editorial

Challenges, controversies, and innovations in arthroplasty

Total knee and hip arthroplasty (TKA and THA) are considered to be the most significant breakthrough Orthopaedic Surgery because of their remarkable, long lasting and reproducible results, in patients affected by severe arthritis. These reconstructive procedures not only relieve pain but also improve the quality of life of these disabled individuals. Various National registries have now confirmed that majority of the presently used knee and hip prostheses can survive for more than two decades. Due to the reasons above, the number of arthroplasties performed across the globe is gradually increasing, and it is expected to increase by 174% in the United States by 2030.¹ This rise in numbers of Arthroplasty is even much higher in emerging countries, and therefore it is projected that the worldwide number is likely to double within the next two decades. Indications for Arthroplasty have now extended to both the younger and older individuals and also to the other joints like shoulder, elbow, wrist, finger joints, ankle, and foot. Chan et al.² reviewed their 7067 TKAs performed and found only 14 (0.198%) deaths within 30 days of TKA and thus concluded that TKA is a safe procedure. The predominant cause of mortality was a cardiopulmonary disease.

With the ongoing advancements in surgical technique, medical technology, and prosthesis design, knee replacement surgery is continually evolving. Despite the good results and track record, many variations in technology and implants related to Arthroplasty have been introduced in the recent past, perhaps keeping the aim of further improving the outcomes. Several new implants are being introduced in the market by the industry, claiming superiority over the existing implants. It is essential to carefully evaluate these newer implants before deciding to use on the patients because 'new is not always the best.' It has been confirmed by Anand et al., in a survey of the Australian Joint Replacement Registry, where they could not find any benefit of the newly introduced prostheses in the market during a five-year study period. On the contrary, 30% of this new implants were associated with a significantly worse outcome compared to the existing implants.³ Hence, it is imperative that the clinicians do not get influenced easily with the newer implants and technologies and must consider the 'track record' and the highest available evidence regarding the safety and improved benefits of these implants and technologies over the existing ones, before applying to their patients. Preston et al.,⁴ have reported that the alternative bearing surfaces are being used more often these days in younger and active patients with the hope to add long life to this prosthesis. Although these bearing surfaces although have shown promising results in vitro, these lack documented long-term clinical benefits.

Vaishya et al.⁵ have pointed out from their research that even the sophisticated investigation like CT scan have fallacies in predicting the component size during TKA and hence cannot be entirely relied on at present and requires further fine-tuning.

TKA is a well-established treatment modality, and more recently, partial knee arthroplasty has seen a resurgence in interest and popularity. In the review articles, Tibrewal and group^{6,7} have given a detailed account of uni-compartmental and patellofemoral arthroplasty and discussed the present status of these prostheses, with their indications and contraindications. Rotating hinge knee prostheses are most commonly indicated for infection, aseptic loosening, instability and bone loss. These implants can provide good early outcome from challenging and complex knee situations of the knee but continue to have a high complication and revision rates and therefore should be reserved for cases where less constrained devices cannot be used.⁸

Many factors can influence the success of knee replacement surgery, including patient selection, prosthesis design, the extent of the damage to the joint, accuracy of the surgical technique regarding soft tissue balancing and limb alignment, and effectiveness of the post-operative rehabilitation program. Hasija et al.⁹ from their analysis of the literature reported that the nerve injuries during THA are uncommon, but its incidence is higher in patients with hip dysplasia and history of previous hip surgery. These injuries can be catastrophic for the patients and may be associated with medico-legal consequences. Recently, the focus of attention of Arthroplasty Surgeons has now shifted from the implants to optimizing the clinical outcomes of their patients, by non-implant factors like minimizing post-operative pain, reduction of bleeding, faster rehabilitation and minimizing the hospital stay and costs. Pain relief after TKA is an essential area of concern and is directly related to the patient satisfaction and clinical outcomes. It is recommended that multimodal pain regimens be effective as these use different agents and modes of delivery to synergistically address pain at many levels of the pain pathway.¹⁰ In a comparative study, Vaishya et al.¹¹ have analyzed the effect of the use of a short and long-term tourniquet during primary TKA and found that the use of a short duration tourniquet during TKA gives better symptomatic pain relief in the early postoperative period as compared to long duration use of a tourniquet. However, it is associated with increased blood loss, more operating time and a lesser clear operative field. Akil et al.¹² have discussed a rare complication of artificial implants, in the form of metal hypersensitivity, which is most common with nickel and cobalt chromium material. It is crucial to document pre-operatively about any

history of metal allergy because the metal hypersensitivity usually require formidable revision surgery and it can be avoided in these patients by using alternative metallic implants like Zirconium with multilayer coatings.

In this exclusive issue on Arthroplasty, several topics related to the evolving technology, implants and challenging situations requiring arthroplasty have been discussed. Reconstruction of segmental defects or pelvic discontinuity after failed THA pose a tremendous surgical challenge, which can be addressed with either a megaprosthesis, augments, customized components or an Allograft Prosthetic Composite. Gautam and Malhotra¹³ and Hasenauer et al.¹⁴ have discussed the pros and cons of these modalities in great detail. Singhal & Ram Mohan¹⁵ have provided a distinct account of the reverse shoulder arthroplasty and have emphasized that even though it is becoming trendy these days, it is associated with much higher complication rates than the total or hemiarthroplasty of the shoulder. Total hip replacement (THR) in patients with tuberculous arthritis of the hip is controversial. Tiwari et al.¹⁶ from a systematic review concluded that a THA in tuberculosis of hip could be done selected cases. The most critical factors to achieve success include the accurate diagnosis, effective pre and postoperative anti-tuberculosis therapy, thorough debridement, the two-stage procedure for patients with discharging sinus.

Arthroplasty is becoming increasingly popular globally, including in India and the medical tourism might have contributed to this popularity. The Indian Arthroplasty surgeons have now also started been publishing their research work in reputed journals. In a systematic review, Vaishya et al.¹⁷ of the most cited Indian papers in the last ten years and observed that publications in high impact and reputed journals attracted more citations and created more impact. It was therefore recommended that the researchers should submit their 'good' scientific research work to such journals.

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