

## Letter to the Editor

### Tourniquet Use During Cementation Only During Total Knee Arthroplasty: A Randomized Trial

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*To the editor,*

We read the Level I study by Tarwala and colleagues [11] with great interest. The study compared the operative tourniquet group to cementation tourniquet group in patients undergoing TKA. The authors found no difference in surgical time, postoperative pain, motion of the knee, blood loss, and complications between the two groups. The authors also indicated in their conclusion that they prefer to use the tourniquet only during cementing in TKA.

Although the authors mentioned that there were no previous studies comparing the effects of tourniquet used only during cementing, we found two studies on the same

topic published before the current study [4, 7]. Kvederas and colleagues [4] compared three groups undergoing TKA in a Level II study. In the first group, the tourniquet was inflated before incision and deflated after hardening of the cement. In the second group, the tourniquet was inflated just prior to cementing and was released after its hardening. In the third group, it was inflated before incision and deflated after closure of the incision. In contrast to Tarwala et al., these authors found higher estimated blood loss with the second group (the group that used the tourniquet only during cementation).

The second study by Mittal and colleagues [7] noted higher transfusion rates with the short tourniquet group (cementation tourniquet). The authors had to abandon the study due to unacceptably high transfusion rates in the cementation-only tourniquet group. As both of these studies were not cited by the authors, their findings, which are in contrast to the present study, were not compared in the *Discussion* section. The authors failed to perform a power analysis at the initiation of the study because similar studies were not available in literature.

The timing of deflation of the tourniquet remains unclear in the current study. In the *Methods* section, it is stated that the tourniquet was released in all patients at the completion of cementation of the patella and the knee held in extension with compression of the patella for the subsequent 10 minutes it took for the cement polymerize. If the tourniquet was released after complete polymerization of the cement, the mean tourniquet time in the cementation tourniquet group of 9 minutes (range = 7 minutes to 14 minutes) is less than the time it took for the cement to polymerize completely. If the tourniquet was released just after implantation, but before complete curing of the cement, blood that would flow after the tourniquet's deflation would be mixed with cement at the crucial phase

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(Re: Tarwala R, Dorr LD, Gilbert PK, Wan Z, Long WT. Tourniquet Use During Cementation Only During Total Knee Arthroplasty: A Randomized Trial. *Clin Orthop Relat Res*. 2014;472:169–174.)

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of cement polymerization and weaken the interface for cementation. It has been shown that hyperemia following tourniquet deflation peaks at 5 minutes after deflation [5]. Therefore, it would not provide a bloodless bone for cementation, defeating the purpose of using tourniquet only during cementation.

Additionally, certain discrepancies were found in the references cited in the text and their actual contribution. In the *Introduction*, the authors compared randomized controlled trials featuring patients undergoing TKA with or without tourniquet that show no statistical difference in blood loss or less blood loss when no tourniquet is used. The authors provided three additional studies [2, 6, 13] in their *References* section. However, none of these three papers have studied blood loss with or without tourniquet in TKA. Yang and colleagues [13] investigated the effectiveness and safety of tranexamic acid in reducing postoperative blood loss in TKA, but not of the tourniquet alone. A study by Vandebussche and colleagues [12] has been quoted as showing no difference or less blood loss without tourniquet. However, the study reports higher blood loss without the use of a tourniquet.

Similarly, a study by Kato et al. [3] has been cited as a reference for wound complications following tourniquet use. However, the original study purpose was to detect emboli during the tourniquet inflation phase and to identify the composition of the echogenic material. In the *Discussion* section, the authors cited two meta-analyses [1, 10] as references for the absence of differences in pain with or without the use of tourniquet. However, both of these articles failed to assess pain as a part of their meta-analysis. Also, no difference in swelling of the knee has been shown as a finding of both these meta-analysis when they have not assessed the same. In fact, both of these studies discussed increased swelling of the extremity with tourniquet use in their *Introduction*. Alcelik and colleagues used a reference by Silver et al. [8] to cite the increased swelling post-tourniquet use.

A study by Tai and colleagues [9] has been mentioned as reference for a study showing that increased drainage has been correlated to tourniquet pressure more than 225-mm of Mercury. However, this study compared the tourniquet and non-tourniquet group with respect to blood loss, soft tissue damage, pain, swelling rehabilitation, and hospital

stay. It does not address the correlation between tourniquet pressure and drainage. In fact, Tai et al. [9] did not use a drain in their study in order to avoid excessive blood loss.

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