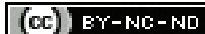


Poller Screw Supplemented Fixation of Tibial Metaphyseal Fractures with IMN- Criticism and Update for Clinicians as per Existing Literature

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Sir,

I read with great interest the article entitled "Intramedullary Nail Supplemented with Poller Screws for Proximal and Distal one-third Shaft Tibial Fracture: A Prospective Interventional Study from North India [1]. I congratulate the authors for the study undertaken. However, certain key concerns have remained unaddressed and require some criticism and information on literature updates.

It should be highlighted that where the name "POLLER" or "BLOCKING" screw came from. It originated from the name "BOLLARD". And it does exactly the same. It stands in the way of a nail and doesn't let the nail go its way, and it only goes in the direction determined by the screw. Besides, can also reduce the fragments and compress them.

Here correction is required as the term blocking screw was first introduced by Donald G and Seligson D in 1983 as they 'block' the nail from malreducing the fracture [2]. The author has not used nailing for the fixation of Grade 3 Gustilo and Anderson open tibial fractures. Unreamed intramedullary cannulated nailing has been used now, for a long time in type 3 open fractures. A meta-analysis summarised the existing evidence for the use of unreamed intramedullary nailing or external fixators to treat severe open tibial fractures in case of Gustilo Grade III and above cases [3].

Certain key points are required to be emphasised while considering the use of poller screws in tibial fractures for clinicians' knowledge.

- Use the thinnest possible nail while using poller screws, to allow the nail to deform and not break the bone.
- Poller screws, placed adjacent to the nail and perpendicular to the interlocking screw holes, usually in an anteroposterior direction, have been suggested as one possible method for improving the stability of metaphyseal fractures [4,5] and have been described as a reduction tool, used to overcome the displacing forces at the time of introduction of the intramedullary nail [5]. The screws functionally decrease the width of the metaphyseal medulla and are particularly useful with nails of smaller diameter, which has not been emphasised by the authors.
- The screws used for blocking were 4-4.5 mm locking screws
- Intramedullary nails of 8 or 9 mm diameter are used which are unreamed and cannulated
- The acceptable mis-alignment as per Trafton's recommendations is less than 5 degrees of varus-valgus angulation, 10 degrees of anteroposterior angulation, 10 degrees of rotation, and 15 mm of shortening [6,7].

Moreover, it is pertinent to decide where to place a poller screw? Author failed to give details about it. As per literature, there are three known ways:

- **Concave side of the fracture.**
- **The acute angle of the fracture lines.** Alignment lines are drawn on both fragments and a screw is placed at the acute

angle between both lines. The Poller screw goes in the bone slightly away from the centre.

- **Mobile and static fragment.** Poller screw is usually placed in a dynamic fragment of the fractured tibia. It is very rare that poller screws are required in both static and dynamic fragments.

The author has not emphasised the evolution and generations developed of "Poller screws" over time. Readers will find it informative too, as mentioned below:

First generation of poller screws were screws inserted to create a corridor inside the bone.

Second generation of poller screws is inserted in a way that the fracture is reduced and compressed using the elastic properties of a nail. The nail would deflect and create long-term compression on the fracture. It was not a rare occurrence that reduction has improved over time. But the poller screws are placed on one side of the fracture only (one fragment).

Third generation of poller screws are screws inserted on both sides of the fracture.

Use of poller screws from the use of a single screw to create a corridor inside the bone, 'first-generation' of poller screw, through to the 'third-generation' of poller screw with poller screw placement on both sides of the fracture line to create long-term compression and reduce the working length of the nail [8-10]. Author should have mentioned that depending on fracture pattern, at least one poller screw in the sagittal and one in the coronal plane may be needed to fully control alignment to avoid the failure seen in one patient in Ricci WM et al., cohort [11].

Poller screw are placed at right angle to the interlocking screw holes, usually in an anteroposterior direction, beside the nail close to apex of deformity, Centre of Rotation of Angulation (CORA) [12], improve the stability of metadiaphyseal fractures [4,5] and enables control of angular deformities [9]. Moreover, as an alternative to poller screws, K wires have been described as reduction aids and used in a similar fashion to poller screws to aid centralisation of IM nails, which are removed post locking screw insertion. Poyanli OS et al., place K wires before the guidewire, as we do with poller screws [13].

Other techniques to prevent malreduction include, the use of percutaneous clamps and provisional plating with unicortical screws. The use of a femoral distractor or an external fixator can be helpful to hold the fracture in a reduced position while nailing [14].

Results shown to be evaluated with Karlström-Olerud's scoring criteria by the author. This does not include the functional outcomes of knee in these patients and as per the literature to circumvent this limitation for functional result evaluation, studies have used AOFAS (100 points) ANKLEHINDFOOT SCALE for ankle and RASMUSSEN'S FUNCTIONAL SCORE SYSTEM for knee [15].

Finally, author gave the details about the complications found in the study but he has not described as to how he managed those complications, which is a very important implications for the readers of this article. The current study has several limitations. It is a non randomised, non controlled clinical trial. There were several different surgeons carrying out the technique [16].

1. The term poller screw was first used by Krettek. The term blocking was used by Donald, however, the basic principle of both are the same.
2. In Grade 3 GUSTILO ANDERSON, clinician can do unreamed intramedullary cannulated nailing or external fixators but we had preferred exfix to prevent infection. In our clinical experience, the authors have found a high rate of infection by doing intramedullary nailing in grade 3.
3. The authors used 4.5 mm poller screws, with an Intramedullary nail of 8 mm diameter which was unreamed and cannulated.
4. Poller screws were placed on the concave side of the fracture as mentioned in the article.
5. Depending on fracture pattern, poller screws were used to decrease varus/valgus and procurvatum/recurvatum deformity. The authors used 2 poller screws in 2 different planes to correct the deformity.
6. The poller screws were retained to maintain the reduction and to increase the bone-implant construct stability.
7. In response to the query from the reader, whether K-wire can be used as an alternate to the poller screw, the authors emphasise that Kirschner wire cannot be used to maintain the reduction.
8. Regarding management of complications, nothing was done for shortening of 0.5 cm, physical therapy was advised for decreased range of motion and pus discharge was treated conservatively with debridement, and appropriate antibiotics after getting the antimicrobial sensitivity test.
9. Karlström-Olerud's scoring was frequently used by many authors previously. This score includes 11 components to evaluate the functional outcome of the patient, that's why Karlström-Olerud's scoring have been used in the present study.

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