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*Perspective*

# Use of Minimal Invasive Technique in Dynamic Hip Screw Fixation

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Implants used in inter trochanteric fracture are categorized into two types: intramedullary, extra-medullar[1]. Intra-medullar implants are usually less invasive and the choice of patients, who have co-morbidities restricting the surgical exposure and anesthesia time[1–3]. Commercially available intramedullary implants are 20 times costlier than conventional dynamic hip screw (DHS) implant. On reviewing the literature, no many articles focused the advantages of minimally invasive technique (MIDHS) in DHS fixation[4], so we discuss economically viable MIDHS technique for patients requiring short operating time and less soft tissue handling in inter-trochanteric fracture fixation treatment here.

The implant used is conventional DHS 130 and 135 degree barrel plate. Patient position and draping are all same as the routine DHS fixation. Once reduction achieved, image intensifier guiding barrel plate initially placed exactly over the proximal thigh, where implant is planned to place. Two vertical lines are drawn, and one is from the second and another is from third hole of implant. Third horizontal line is drawn exactly over the proximal femoral shaft. Skin and deep incision made along the horizontal line from intersection of first to second vertical line (Fig. 1). Specially designed 135 ° angle guides to place over the lateral cortex and guide wire inserted into the centre of neck with antero-posterior and lateral C-Arm view control (Fig. 2). Instead of triple reaming, 8 mm and 13 mm reamers are used through 14 mm sleeve (Fig. 3).

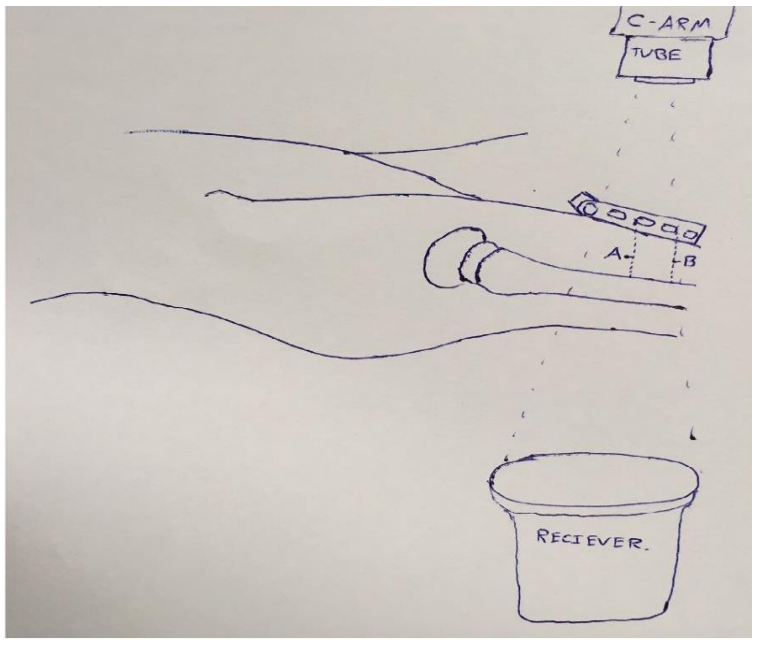


**Fig.1** 135 ° DHS Barrel plate placed exactly over the anterior thigh to exactly superimpose over the fracture site.

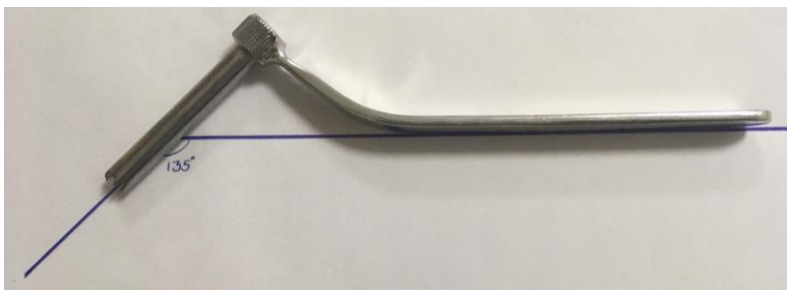


**Fig.2** Slim 135 °angle guide with reference over the skin.


**Fig.3** A: DHS Tap Sleeve Holding 8 mm reamer. B: DHS Spanner Sleeve Holding 13 mm reamer.

Once head screw inserts in place 135 °, 4 hole barrel plate slides over the lateral cortex with barrel facing the surgeon, and then the plate is flipped 180 °in longitudinal axis and barrel negotiated over the head screw with reduction instrument (Fig. 4). Cortical screws are placed through the plate in routine fashion to provide special precautions by using long drill bit and bone tap with appropriate sleeves.

**Fig. 4** Dynamic compression device.

The pitfalls of MIDHS are as follows:

1) As incision exactly over the second and third hole, the first and fourth screws are able to place with slight retraction of soft tissue proximally and distally. This can be easily achievable by hinging the sleeve over the holes and steady holding of sleeve while drilling and tapping. Surgeons may find it difficult to insert Richard's compression screw in this approach, and once the screwslipsout of the driver into the wound, it is a nightmare to take the screw out from such a small incision. In this situation,weuse a 2-0 Nylon material around the screw with ends holed by the surgeon and negotiate into the lag screw[5].
2) About blood loss, special care shouldbe taken not to injure the femoral perforators as it's extremely difficult to attain haemostasis in such a small wound. Ouradvice is not to use sharp instruments tangentially proximal to the incision site for head screw incision. Instead erasing of soft tissue using periostium elevator will achieve safe proximal exposure. As MIDHS technique doesn't involvemany soft tissues, there is 2% reduction in post-operative hemoglobin compared to conventional techniques[1,5].
3) On the cost aspect,by selecting DHS implant combined with minimal invasive technique on patient who has co-morbidity, surgeon might significantly decrease the economic loadingcomparedto intramedullary implant[6].
4) For surgical time, most of the surgeons report 30 to 40 minutes of total operating timeafter gone through a short learning curve. Itshows an encouraging point compared to both conventional DHS of 50–60 minutes and intramedullary implants of 60–90min[1,2].
5) For requirement of special instruments, most of the surgeons think special instrument sets are necessary to perform MIDHS but the truth is instruments used for routine fracture fixation and conventional DHS instruments are more sufficientthanthose of MIDHS.

The required instruments of MIDHS are: 1) Routine surgical knifes for exposure. 2) Conventional periosteum elevator. 3) Conventional 5 mm drill sleeve with handle bent 45 ° in relation to sleeve. 4) Conventional guide wire and measuring instrument. 5) Eight mm and 13 mm cannulated reamers with conical end (Conventional). 6) Conventional DHS spanner. 7) Barrel reduction instrument / long cannulated screw driver. 8) Impactor. 9) Four point five mm drill bit length in accordance with drill sleeve length. 10) Conventional tap and screw driver.

The disadvantages of MIDHS are as follows: It can't be used forunstable intertrochanteric fracture, learning curve, and difficult to arrest perforator bleed once the small incision is injured through.

In summary, MIDHS technique hassimilaroutcomeswith lower cost compared with intramedullary and conventional DHS fixation in terms of operative time, blood loss, duration of hospital stay and

fracture union rate[2]. Hence we recommend MIDHS fixation technique tolow economic resource patient with co-morbidities. There is no need of specialized instruments forperformance and the use of slim 135 degree angle sleeve length of incision may even shortened.

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