Dear Editor and Reviewers,

Thanks very much for taking your time to review this manuscript. I really appreciate all your comments and suggestions! We have addressed the comments and modified them in the revised manuscript. Please find my itemized responses in below and my revisions/corrections in the re-submitted files.

Wish best wishes!

Reviewer #1:

Comment 1: Line 55: Please write in lowercase (Pooled). Line 86: Please remove the underline. Line 87: commonest ◊ common (or most common) .Line 179, 267, 360: Please separate the sentences. Also, overall manuscript, there are a lot of spacing errors. Please correct them.

Response: We are really sorry for our careless mistakes, thank you for your reminding. According to your reminding, we have corrected them respectively.

Comment 2: To compare the result after use of different implants, demographic data or those before operation between two groups should be compared would be important; fracture type, reduction quality, implant position and age of the group which reflects osteoporosis are 4 potential important factors to gain good result after treating proximal femur fractures in addition to implants choice such

as CCS or FNS. Time taken from injury to surgery may be also an important factor. Additional analysis regarding these would improve the completeness and value of this study. If it is difficult to do this, they can be mentioned as limitations.

Response： Your suggestion really means a lot to us. Yes, it is important to compare demographic data or those before operation between two groups in analysis of efficacy of different implants. Fracture type, reduction quality, implant position, age of the group and time taken from injury to surgery would be important factors to the results. However, in our meta-analysis, all of included studies did not describe them specifically. Because it is difficult to analyze the factors, we have mentioned them as limitations in line 337 to 340.

Comment 3: Line 254 AVN of femoral neck ? Do you mean AVN (Osteonecrosis) of femoral head?

Response： We are very sorry for our incorrect writing. According to your reminding, we have corrected them as "AVN of femoral head" respectively in line 251, line 252 and line 256 . We are very grateful for your reminding.

Comment 4: The Discussion part may start with brief background, study method and the main findings in your study to improve reader's understanding. Usually, these take 3-4 sentences in one paragraph. Then, in another, separate paragraph, the authors may describe the result one-by-one with authors' interpretation or hypothesis. - Line 267-290 may be placed in the Introduction part (Background and Purpose of the study) and summarized in 1-2 sentences in Discussion part.

Response： Thanks for your great suggestion on improving the accessibility of our manuscript. According to your suggestions, we have re-written this part and summarized them in one paragraph of discussion part.

Comment 5: Line 299-301 looks weird. Reduction is independent from the type of implants and same closed reduction technique for the femoral neck fracture could be achieved regardless of implant type. If someone perform open reduction for femoral neck fracture, the blood loss would increase according the description, but the operation might also take longer contrary to the study finding. Although FNS can be implanted with minimally invasive technique (said by the company), it has been introduced recently and may need learning curve. Moreover, sometimes it may lead to surgical trauma to implant FNS with a small window using MIS. All of these may lead to similar operation time, but more blood loss.

Response： Once again, thanks for your nice suggestion. Although FNS has been introduced recently, it is reported it features simple operation (short learning curve). Besides, CCS requires better spatial distribution of three screws, which may warrant the repeated adjustment of guidewires and increase the number of intraoperative fluoroscopies. Moreover, FNS required open reduction, which could lead to surgical trauma with a small window of exposure. This may lead to similar operation times but more blood loss. And the interpretation have been provided in line 278 to 286.

Comment 6: Line 301: the connector 'in addition' seems improper for use considering the context.

Response： Thanks for your kindly reminding. We feel sorry for our poor writings. We have modified the sentence again in line 321.

Comment 7: Line 301-303 most of fracture healing may gain within/around 3 months after operation, but HHS may be evaluated at 6 months or 1 year (it contains pain, ADL ability, the walking distance etc). Thus, the interpretation that the reason for higher HHS in FNS group originate from early fracture healing seem insufficient. What do you think that the less shortening and subsequent less loss of vertical and horizontal offset may affect higher HHS (as described in Line 312-314)?

Response： Your suggestion really means a lot to us. Previous studies have reported that femoral neck shortening can decrease hip function, FNS decreases the incidence of femoral neck shortening, and patients treated with FNS could perform the timely postoperative weight-bearing activities. We think they may be the reason for higher HHS in FNS group. And we have added them in line 322 to 325.

Comment 8: Line 304-305 should be placed in Methods part. 1) Screw loosening may be affected by fracture type, quality of bone and reduction and implant position; thus it might show less difference between two groups 2) Screw back-off. What the cut-off value for screw back-off? 0.1 mm? 5 mm? And one of advantage of FNS is that it may show little or less back-off because it resist to the sliding and has barrel for sliding. Thus, FNS show less back-off when compared with CCS. Moreover, if shortening was less in FNS, it would be reasonable to

show less back-off 3) screw penetration is usually followed after AVN or nonunion. According to these, why did fixation failure showed no difference between two groups? Please provide the authors' hypothesis.

Response：Thanks for your suggestion and reminding. Line 304-305 have been placed in methods part. Considering your nice suggestion, we have modified the interpretation in line 302 to 306 and the results might be influenced by factors such small samples and short follow-up time.

Comment 9: Line 307-312 looks inappropriate to be described because the authors did not compare with arthroplasty or did not use this criteria for shortening. Both arthroplasty and degree of shortening are apart from this study methods.

Response：Thanks for your suggestion. We have deleted the sentence.

Comment 10: Line 315-331 can be summarized. Line 317-319 It's not clear which fixation system showed less shortening (FNS or CCS?).

Response：Thanks for your suggestion. Line 315-331 have been summarized and modified in discussion part. Previous studies showed that the stability of FNS was superior to that of CCS , and FNS provides superior resistant resistance against femoral neck shortening. In our meta-analysis, we also found that the chances of femoral neck shortening were lower when using FNS than when using CCS . Line 317-319 have been modified again in line 292-300.

Comment 11: Line 327 'sliding pressure' Do you mean sliding force?

Response： We feel sorry for our careless mistakes. "sliding pressure" means sliding force.

Comment 12: Line 332-350 Many authors point the vascular theory such as injury to lateral retinacular artery as for causing AVN and, time to surgery, fracture type and reduction quality may be major determinant for occurrence of AVN regardless of implants type.

Response： We agree with your comment strongly. Yes, injury to lateral retinacular artery is the main factor for causing AVN, and time to surgery, fracture type and reduction quality may be major determinant for occurrence of AVN. Apart from time to surgery, fracture type and reduction quality, it is reported that the large volume of the implant could damage the blood vessels of the femoral head. As far as the design of FNS is concerned, the diameters of the screw bolt and anti-rotation screws were 6.4 mm and 10 mm, respectively. Therefore, similar to CCS, FNS could also preserve the peripheral vessels in the femoral head.

-----End of Reply to Reviewer #1------

Reviewer #2:

Comment 1: QUADAS-2 has to be included.

Response： According to the published studies, QUADAS-2 is a tool for the quality assessment of diagnostic accuracy studies. Our study is to compare the treatment outcome of two different implants in femoral neck fracture, so we think that QUADAS-2 should not be included.

The references as follow：

Whiting PF, Rutjes AW, Westwood ME, Mallett S, Deeks JJ, Reitsma JB, Leeflang MM, Sterne JA, Bossuyt PM; QUADAS-2 Group. QUADAS-2: a revised tool for the quality assessment of diagnostic accuracy studies. *Ann Intern Med*. 2011 Oct 18;155(8):529-36.

Comment 2: SROC curves are needed.

Response： As far as we know, the summary receiver operating characteristic(SROC) curves are recommended to represent the performance of a diagnostic test, based on data from a meta-analysis. Therefore, we think it is inappropriate that SROC curves are needed.

The references as follow：

Walter SD. Properties of the summary receiver operating characteristic (SROC) curve for diagnostic test data. *Stat Med*. 2002 May 15;21(9):1237-56.

Comment 3: Details of study included should be presented in tabular format.

Response： Thanks for your nice suggestions. We have specified the number of included studies in each database in Figure 1 and we think the flow diagram of the study selection process is more easy to understand.

-----End of Reply to Reviewer #2------

Reviewer #3:

Comment 1: sentence in the abstract: "However, there is a lack of evidence regarding the efficacy of FNS in the treatment of femoral fractures as compared to traditional internal fixation." That he says there is no evidence, there is no evidence in a systematic review and meta-analysis, or there is none at all. I think you mean there is no systematic review and meta-analysis.

Response： Thank you for your reminding. We have rectified the sentence as "However, there is no systematic review and meta-analysis investigating the efficacy of FNS in comparison with that of traditional internal fixation in the treatment of femoral fractures." in the abstract.

Comment 2: In the goal section in the abstract: How do you intend to achieve your goal? By systematic review and meta-analysis? Mention your method.

Response: Thanks for your nice suggestions. We have modified the sentence as "To assess the efficacy of FNS in comparison with that of cannulated compression screws (CCS) in the treatment of femoral fractures through systematic review and meta-analysis." in the goal section in the abstract.

Comment 3: Some keywords are not Mesh.

Response: Thank you for your reminding. We have used the Mesh as keywords, such as internal fixators and treatment outcome.

Comment 4: Mention PubMed search strategy.

Response: Thank you for your reminding. We have provided the PubMed search strategy in line 116 to 123.

Comment 5: Exclusion criteria: "(vi) its data was incomplete". What is meant by data that, if it does not exist, is incomplete?

Response: Thank you for your reminding. We have deleted the sentence in exclusion criteria.

Comment 6: The first two paragraphs discuss the repetition of the introduction in another language. It does not need to be repeated so much. Write a summary.

Response： According to your nice suggestion, we have summarized the first two paragraphs in the discussion part into one paragraph.

Comment 7: Mention suggestions at the end of the discussion.

Response： Thanks again for your valuable suggestion. We have added some suggestions at the end of the discussion in line 345 to 349.

Comment 8: Fig. 1: It is better to specify how many studies have been obtained in each database. For example, how many PubMed? How many Embase? Etc

Response： According to your nice suggestions, we have specified the number of studies obtained in each five databases shown in Figure 1.

-----End of Reply to Reviewer #3------