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REVIEW: Short versus Long Cephalomedullary Nails for AO/OTA 31-A3 Reverse-Obliquity Intertrochanteric Femoral Fractures: A Focused Systematic Review

Abolfazl Ghadiry Assistant Professor of Orthopedic Surgery, Orthopedic Research Center, Mazandaran University of Medical Sciences, Sari, Iran

Mohamadreza Daryaee Assistant Professor, Department of Orthopedics, Golestan University of Medical Sciences, Gorgan, Iran

Seyed Sadegh Shirdel

Sadegh Taheri Assistant Professor of Orthopedic Surgery, Orthopedic Research Center, Mazandaran University of Medical Sciences, Sari, Iran

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Correspondences:
Seyed Sadegh Shirdel,
Assistant Professor of Orthopedic Surgery, Orthopedic Research Center, Mazandaran University of Medical Sciences, Sari, Iran.
Email: Dr.s.shirdel@gmail.com
ORCID:
0009-0005-1415-9869

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ABSTRACT

Reverse-obliquity intertrochanteric fractures (AO/OTA 31-A3) are mechanically unstable proximal femoral fractures for which cephalomedullary fixation is generally preferred. Whether a short or long cephalomedullary nail should be used remains controversial, particularly when the fracture line approaches the subtrochanteric region. To synthesize the A3-specific clinical and biomechanical evidence comparing short and long cephalomedullary nails and to determine whether current evidence supports routine use of a long nail.
A focused systematic review was performed using PubMed/MEDLINE through August 2026, supplemented by backward citation screening. Eligible core studies specifically involved AO/OTA 31-A3 or reverse-obliquity fractures and either directly compared nail length, analyzed nail length as an outcome-related variable, or provided an A3-specific biomechanical comparison. Mixed-fracture studies were used only as contextual evidence. Owing to heterogeneity and overlapping institutional datasets, results were synthesized narratively rather than pooled quantitatively.
Six reports formed the core synthesis: four clinical reports and two A3-specific biomechanical studies. In the most direct comparative clinical cohort (170 patients), short and long nails had similar radiographic healing, nonunion, reoperation, readmission, and mortality; short nails were associated with lower blood loss (111.2 vs 176.7 mL), lower transfusion use (37% vs 55%), and shorter procedures (118.7 vs 149.0 min). Larger reverse-obliquity cohorts published subsequently found no consistent outcome advantage for long implants and recommended short implants when sufficient working length and acceptable reduction are achievable. One cadaveric A3 model found similar overall construct stiffness with a short PFNA when the fracture remained 2 cm proximal to the distal locking screw, whereas a synthetic A3.3 model demonstrated greater varus-related angular change with the shortest nail than with mid- or long-length nails.
Current clinical evidence is modestly favorable to short cephalomedullary nails for appropriately selected AO/OTA 31-A3 fractures because major healing and revision outcomes appear comparable while operative burden is lower. Routine long-nail use is not supported for every A3 fracture. Mid- or long-length implants remain reasonable when distal fracture extension, severe A3.3 morphology, displacement, or inadequate short-nail working length creates biomechanical concern. Reduction quality and cortical support remain critical determinants of success.

Introduction

Reverse-obliquity intertrochanteric fractures represent a distinct unstable pattern within the AO/OTA 31-A3 category. The major fracture line runs from distal-lateral to proximal-medial, opposite to the more common intertrochanteric configuration, and the construct is exposed to medialization of the shaft and substantial shear. The 2018 AO/OTA compendium recognizes A3.1, A3.2, and A3.3 patterns, with increasing complexity toward multifragmentary configurations. Historically, these injuries have demonstrated higher rates of fixation difficulty and mechanical failure than stable intertrochanteric fractures (2,3).

The mechanical distinction is clinically important. Haidukewych et al. reported a 32% rate of failure to heal or fixation failure among internally fixed reverse-obliquity fractures in an early series, with worse results when reduction or implant placement was poor. A prospective randomized trial by Sadowski et al. subsequently demonstrated better outcomes with an intramedullary nail than with a 95-degree fixed-angle screw-plate in elderly patients with AO/OTA 31-A3 fractures. Later series using second-generation cephalomedullary nails reinforced the importance of an anatomic or near-anatomic reduction and appropriate implant positioning (3-5).

These observations helped establish intramedullary nailing as the dominant fixation strategy for reverse-obliquity fractures. The intramedullary position provides a load-sharing construct and an internal buttress against uncontrolled shaft medialization, while contemporary cephalomedullary nails permit fixation of the femoral head-neck segment through a lag screw, blade, or paired cephalic screws. Clinical series with proximal femoral nails, intramedullary hip nails, PFNA constructs, InterTAN-type nails, and related devices have generally confirmed that cephalomedullary fixation can achieve reliable union in A3 fractures, although A3.3 morphology and loss of posteromedial support remain challenging (6-10).

A separate controversy concerns nail length. Long nails theoretically span more of the femur, bypass distal fracture extension, and may reduce stress concentration near the end of the implant. Conversely, they often require greater canal preparation, more technically demanding distal locking, and longer operative exposure. Short nails are simpler to insert and may reduce operative time and blood loss, but concern persists that the distal tip or locking region may lie too close to an A3 fracture line, particularly in fractures that extend into the subtrochanteric region. General intertrochanteric literature increasingly supports short nails for many fractures, but most studies combine A1, A2, and A3 patterns and therefore cannot answer the A3-specific question directly (17-22).

The emergence of A3-specific comparative studies now permits a more focused assessment. Konda et al. directly compared short and long cephalomedullary nails in 170 AO/OTA 31-A3 fractures; Breuer and colleagues subsequently analyzed large reverse-obliquity cohorts with explicit attention to implant length and fracture morphology; and recent biomechanical studies have tested short versus longer constructs in A3 and A3.3 models. (11-16) The purpose of the present review was therefore to synthesize this focused evidence, distinguish clinical data from biomechanical signals, and determine whether routine long-nail use is justified or whether short nails can be favored in appropriately selected A3 fractures.

Material and Methods

Review Design and Clinical Question

This review was structured according to the principles of the PRISMA 2020 statement, with modifications appropriate for a focused rapid evidence synthesis. (1) The clinical question was defined using a PICO framework: adults with AO/OTA 31-A3 or explicitly described reverse-obliquity intertrochanteric fractures (population); short cephalomedullary nail (intervention); long or longer cephalomedullary nail (comparator); and healing, nonunion, implant failure, reoperation, mortality, peri-implant fracture, operative time, blood loss, transfusion, radiographic behavior, or related mechanical outcomes (outcomes).

Search Strategy

PubMed/MEDLINE was searched from database inception through August 2026. Search concepts combined fracture morphology terms (“reverse obliquity,” "reverse oblique," "AO/OTA 31-A3," "31A3," "A3.1," "A3.2," and "A3.3") with fixation terms ("cephalomedullary," "intramedullary nail," "Gamma nail," "PFNA," "TFNA," and "InterTAN") and nail-length terms ("short," "long," "length," and "working length"). Reference lists of directly relevant studies, contemporary reviews, and systematic reviews of short versus long cephalomedullary nails were screened backward for additional A3-specific reports.

Representative PubMed search string:

("reverse obliquity" OR "reverse oblique" OR "AO/OTA 31-A3" OR "31A3" OR "A3.1" OR "A3.2" OR "A3.3") AND ("cephalomedullary" OR "intramedullary nail" OR "Gamma nail" OR "PFNA" OR "TFNA" OR "InterTAN") AND ("short" OR "long" OR "length" OR "working length")

Eligibility Criteria

Core inclusion required a study to examine AO/OTA 31-A3 or clearly defined reverse-obliquity fractures and to (1) directly compare short and long implants, (2) analyze nail length as a variable related to clinical or radiographic outcome, or (3) provide a biomechanical A3-specific comparison of different nail lengths. Reports that mixed fracture patterns without separately interpretable A3 data were excluded from the core synthesis but could be cited as contextual evidence. Case reports, purely technical notes without outcome data, and studies unrelated to nail length were excluded from the core evidence set.

Study Selection and Data Extraction

Records identified through the focused database search and backward citation screening were assessed against the eligibility criteria. Full texts judged potentially relevant were evaluated for A3-specific clinical or biomechanical data. For each included report, the extracted items comprised author and year, study design or model, sample size, fracture morphology, implant system and length comparison, clinical or mechanical outcomes, follow-up where applicable, and the authors' main conclusions. Related institutional datasets were identified to prevent double counting in the synthesis.

Quality Appraisal

Clinical observational studies were evaluated using domains adapted from Newcastle-Ottawa considerations: cohort selection, comparability and control of confounding, outcome ascertainment, and adequacy of follow-up. Biomechanical studies were assessed qualitatively for model relevance, standardization of fracture morphology, loading protocol, and translational limitations.

Data Synthesis

Clinical and biomechanical evidence were synthesized separately. Because implant definitions, A3 morphology, outcome definitions, and study designs were heterogeneous, and because the two Breuer reports represented related datasets, meta-analysis was not considered appropriate. A structured narrative synthesis was used to avoid double counting and inappropriate pooling.

Results

Search Results and Study Selection

The focused search and citation-chaining process yielded six reports that directly informed the nail-length question in reverse-obliquity/A3 fractures: four clinical reports and two A3-specific biomechanical studies. (11-16) Two Breuer reports were generated from related institutional work and were treated as linked evidence rather than fully independent cohorts. Additional A3 studies addressing reduction, implant choice, and fracture subtype, as well as mixed-fracture short-versus-long trials and meta-analyses, were used only to provide context. (3-10,17-22).

The original working search record did not retain reliable counts for all database hits and duplicates; therefore, those values were not reconstructed. The PRISMA-style diagram transparently reports the reproducible screening pathway and the final six-report core evidence set.

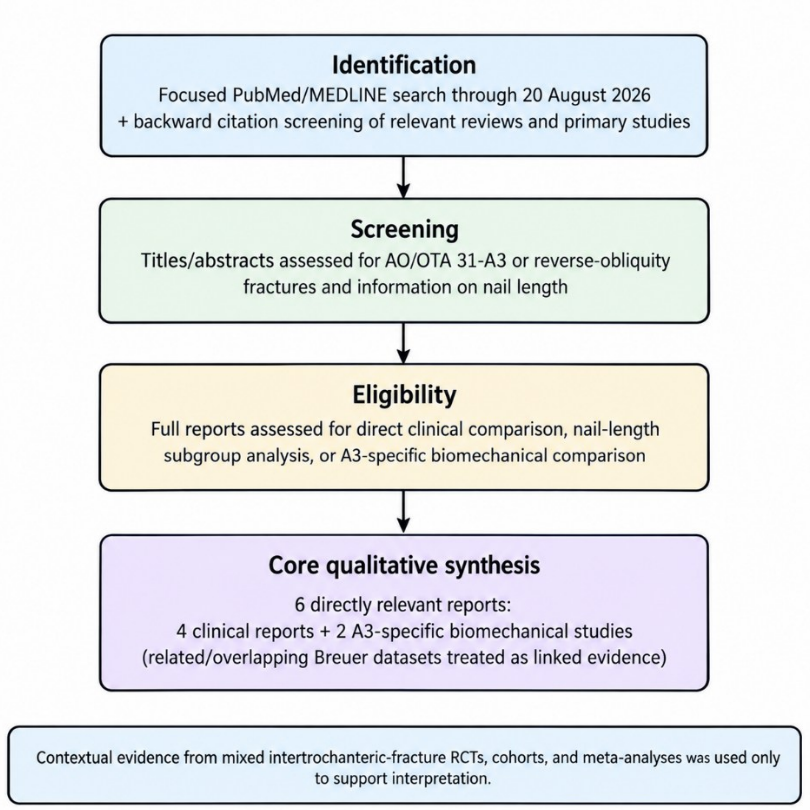

Figure 1. PRISMA-style focused systematic-review search and selection pathway. The final core synthesis included six reports; unretained identification-stage counts were not retrospectively fabricated.

Characteristics of the Included Studies

The core evidence comprised four clinical reports and two A3-specific biomechanical investigations. The clinical evidence included one direct short-versus-long comparative cohort, two related large reverse-obliquity cohorts examining implant length and morphology, and one radiographic cohort evaluating lag-screw sliding. The biomechanical evidence compared short with longer constructs in standardized A3 and A3.3 models.

Clinical Evidence Comparing Short and Long Nails

Direct comparative evidence

The most direct clinical comparison was reported by Konda et al. in 2024. The investigators identified 170 patients older than 55 years with AO/OTA 31-A3.1 to A3.3 fractures and at least 6 months of follow-up; 67 received a short cephalomedullary nail and 103 received a long nail. No significant differences were found in radiographic time to healing, mortality, readmission, nonunion, or reoperation. Short nails, however, were associated with lower intraoperative blood loss (111.19 ± 83.97 mL vs 176.72 ± 161.45 mL; p=0.002), lower transfusion requirement (37% vs 55%; p=0.022), and shorter operative duration (118.67 ± 57.87 min vs 148.95 ± 77.83 min; p=0.002). These associations persisted in multivariable analyses. (11)

Large reverse-obliquity cohorts

Breuer et al. reported a 2025 single-center retrospective series of 286 reverse-obliquity fractures selected from 4,003 per/subtrochanteric fractures. Thirty-nine patients (14%) experienced complications requiring revision surgery. Open reduction and longer operative time were associated with higher complication rates, while a trend toward more complications after long implants was observed in the authors' more proximal "type-a" fracture subgroup (p=0.056). Their classification-based interpretation recommended short implants for selected type-a patterns rather than routine long constructs. (14)

An expanded 2026 analysis from the same research group screened 7,804 per/subtrochanteric fractures and included 552 reverse-obliquity fractures. The overall complication rate was 19% (105 patients), and more than 60% of complications required revision. Implant length did not significantly influence overall outcome or cut-out, whereas malreduction negatively affected malunion/nonunion and prolonged operative time correlated with complications. The authors concluded that short implants can be used safely when severe displacement is absent and sufficient working length is preserved, and they explicitly recommended short implants whenever reasonably possible, particularly for simpler patterns. Because this cohort is related to the earlier Breuer report, the two studies were not numerically combined in the present review (15).

Table 1. Core studies directly informing nail-length selection in AO/OTA 31-A3 fractures

Study	Design / model	Population	N	Length comparison	Key findings	Interpretation
Konda et al. (11)	Retrospective comparative cohort	AO/OTA 31-A3.1–A3.3, age >55 y	170 (67 short, 103 long)	Short vs long CMN	No difference in healing, nonunion, reoperation, readmission, mortality; short: less blood loss, transfusion, and operative time	Direct clinical evidence favors short for perioperative efficiency
Linhart et al. (12)	Cadaveric + synthetic biomechanical	Standardized A3 reverse-oblique model	7 human specimens + synthetic models	240-mm vs 320-mm PFNA	Similar overall construct stiffness; slight gap displacement increase with short; model supported ~2-cm working length above distal locking screw	Supports short when adequate working length exists
Ando et al. (13)	Synthetic biomechanical	AO/OTA 31-A3.3 model	30	170 vs 235 vs 300 mm TFNA	Greater neck-shaft and shaft-nail angular change with 170-mm nail	Caution with very short nails in severe A3.3
Breuer et al. (14)	Retrospective cohort	Reverse-oblique fractures	286	Short vs long implants analyzed	14% revision-requiring complications; trend toward more complications with long implants in proximal type-a patterns	Supports morphology-based selection; short recommended in selected patterns
Breuer et al. (15)	Retrospective cohort; expanded related dataset	Reverse-oblique fractures	552	Short vs long implants analyzed	Implant length did not influence outcome; malreduction and longer surgery more important; short safe with sufficient working length	Largest recent clinical signal against routine long-nail use
Hammond et al. (16)	Retrospective comparative radiographic study	AO/OTA 31-A3 treated with Gamma or TFNA	85	Short vs long subgroup	Lag-screw slide not significantly associated with nail length (p=0.083)	Length alone did not explain proximal-fragment sliding

Radiographic and Mechanical Outcomes

Hammond et al. evaluated 85 reverse-obliquity fractures treated with statically locked single-lag-screw Gamma or TFNA cephalomedullary nails. Mean lag screw slide was 7.8 ± 5.2 mm, and 87.1% of patients demonstrated more than 2 mm of slide. Importantly for the present question, slide was not significantly associated with nail length (short 9.4 ± 5.3 mm vs long 7.1 ± 5.0 mm; p=0.083), nail angle, implant brand, or A3 subtype. This report does not establish equivalence for all clinical outcomes, but it provides additional radiographic evidence that nail length alone is not the dominant determinant of proximal-fragment behavior in statically locked A3 constructs. (16)

A3-Specific Biomechanical Evidence

Biomechanical evidence is more nuanced. Linhart et al. implanted short (240 mm) and long (320 mm) PFNA constructs in artificial and osteoporotic human specimens using a standardized A3 reverse-obliquity osteotomy positioned 2 cm proximal to the short nail's distal locking screw. Overall construct stiffness did not differ materially between short and long PFNA constructs, although fracture-gap displacement was slightly greater with short nails. The authors interpreted 2 cm of working length above the distal locking screw as a biomechanically acceptable range in their model. (12)

By contrast, Ando et al. modeled the particularly unstable AO/OTA 31-A3.3

pattern in 30 synthetic femora fixed with 170-mm, 235-mm, or 300-mm TFNA constructs. Translation during cyclic loading did not differ among groups, but the change in neck-shaft angle was significantly greater with the shortest nail (5.8° ± 1.8°) than with mid-length (2.8° ± 1.3°) or long nails (1.9° ± 0.9°; p<0.001). Shaft-nail angle change showed a similar gradient. The study therefore cautions against indiscriminate use of the shortest construct in severe A3.3 morphology. (13)

Contextual Evidence from Broader Intertrochanteric Fractures

Contextual evidence from broader intertrochanteric populations consistently favors short nails for perioperative efficiency. Shannon et al. randomized 220 patients and found comparable functional outcomes and similar peri-implant fracture and cut-out rates, with shorter operative time in the short-nail group; short nails also tolerated limited subtrochanteric fracture-line extension in that trial. (17) Hulet et al. found no significant difference in complications or failure between short and long nails in their unstable subgroup. (18) A 5,526-patient registry study found no difference in revision risk but reported approximately 18.8 minutes more operative time and 41.1 mL more blood loss with long nails (19).

The direction of these individual studies is reinforced by systematic reviews. Cinque et al. synthesized 3,208 patients and found significantly less blood loss and shorter operative time with short nails, without significant differences in implant failure, reoperation, or peri-implant fracture. (20) Rajnish et al. included 14,547 patients and again found shorter surgery, less blood loss, and lower transfusion rates with short nails; long nails were associated with fewer ipsilateral shaft refractures, a trade-off that remains relevant when choosing implant length. (21) Most recently, a meta-analysis restricted to seven randomized studies (658 patients) reported that short nails reduced operative time by approximately 21.8 minutes and blood loss by approximately 136.7 mL, with no significant differences in functional outcomes, mortality, overall complications, reoperation, or peri-implant fracture. (22) These mixed-fracture data cannot be directly substituted for A3-specific evidence but support the perioperative signal observed in the A3 cohort of Konda et al. (11).

Table 2. Direction of evidence by clinically relevant outcome

Outcome	A3-specific evidence	Contextual evidence	Direction	Clinical interpretation
Healing / union	No significant short–long difference in direct cohort (11)	No consistent difference in broad literature (17,20-22)	Comparable	No demonstrated healing advantage for routine long nails
Nonunion / reoperation	No difference in Konda cohort; length not significant in large reverse-obliquity series (11,15)	No consistent reoperation difference (20-22)	Comparable	Other factors such as reduction appear more important
Operative time	Shorter with short nail in direct A3 cohort (11)	Consistently shorter with short nails (17,19-22)	Favors short	Important in frail older patients
Blood loss / transfusion	Lower with short nail in A3 cohort (11)	Lower blood loss and/or transfusion in large studies/meta-analyses (19-22)	Favors short	Most reproducible perioperative advantage
Lag screw slide	No significant association with nail length (16)	Not a primary outcome in most studies	Comparable	Length alone does not prevent slide
Peri-implant shaft fracture	A3-specific evidence insufficient	Some broad meta-analysis signal favors long nails (21)	Potentially favors long	Relevant for selected high-risk femora, but not proof for routine long A3 fixation
Severe A3.3 stability	Clinical evidence limited	Biomechanical short-nail angular change greater in A3.3 model (13)	Conditional longer benefit	Consider mid/long if distal extension or working length is unfavorable

Risk of Bias and Certainty of Evidence

The clinical evidence base is limited by retrospective design, treatment-selection bias, heterogeneous implant systems, and nonuniform definitions of nail length. The two Breuer reports are related institutional datasets and were treated as linked evidence. The Konda and Hammond studies arise from the same broader academic system and may also share aspects of practice patterns. Biomechanical studies offer fracture-specific control but cannot reproduce patient bone quality, soft tissues, rehabilitation, or biological healing. Accordingly, certainty for a universal short-versus-long treatment effect is low to moderate, whereas certainty that short nails reduce operative burden in appropriately selected fractures is higher because the signal is consistent across A3-specific and general intertrochanteric data (11-22).

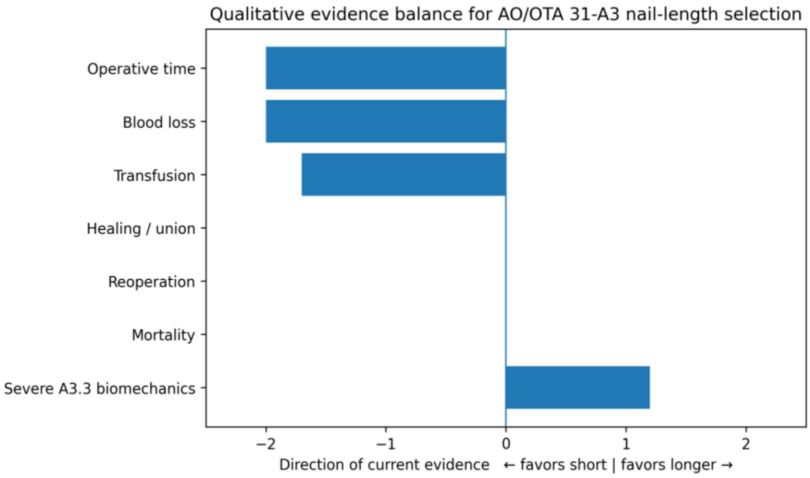

Figure 2. Qualitative direction of the current evidence. The chart represents a narrative synthesis rather than a pooled effect estimate.

Table 3. Qualitative risk-of-bias appraisal of core clinical studies

Study	Selection	Comparability / confounding	Outcome ascertainment	Follow-up	Overall concern
Konda et al. (11)	Low	Some concern (nonrandom nail selection)	Low	Low	Moderate
Breuer et al. 2025 (14)	Some concern	Moderate concern (retrospective selection, morphology-driven treatment)	Low	Some concern	Moderate
Breuer et al. 2026 (15)	Some concern	Moderate concern; related/expanded dataset	Low	Some concern	Moderate
Hammond et al. (16)	Some concern	Moderate concern (radiographic subset, nonrandom length)	Low	Some concern	Moderate

Discussion

Principal Findings

The principal finding of this focused systematic review is that the available clinical evidence does not support routine use of a long cephalomedullary nail for every AO/OTA 31-A3 reverse-obliquity fracture. The most direct comparative A3 study found no advantage for long nails in healing, nonunion, reoperation, readmission, or mortality, while short nails reduced operative duration, blood loss, and transfusion exposure (11). The larger reverse-obliquity datasets published subsequently likewise failed to demonstrate a consistent outcome benefit from long implants and increasingly framed implant selection around fracture morphology and working length rather than the A3 label alone (14,15).

This finding is clinically plausible in older hip-fracture patients. Any reduction in operative duration, blood loss, and transfusion exposure is potentially meaningful in a frail population, particularly when the mechanical outcome is not compromised. Mixed-fracture randomized and registry evidence consistently reproduces the same perioperative advantage for short nails. (17-22) The present synthesis therefore supports a modest default preference toward short cephalomedullary nails in A3 fractures when the fracture line remains sufficiently proximal to the short-nail locking region and an acceptable reduction can be achieved.

Clinical Interpretation of Nail Length by Fracture Morphology

The phrase “appropriately selected” is essential. Reverse-obliquity fractures are not mechanically uniform. A3.1 and A3.2 injuries may be relatively simple, whereas A3.3 fractures can contain a lesser-trochanteric fragment, posteromedial deficiency, comminution, and more distal extension. Park et al. reported longer union time and more complications in A3.3 than in A3.1/A3.2 fractures, and Makki et al. linked implant failure to more severe A3.3 morphology. (6,7) Factor et al. later found that A3 subclassification itself was not sufficient to predict clinical outcome, emphasizing that the geometric details of an individual fracture and the achieved reduction likely matter more than the classification suffix alone (10).

A practical interpretation is therefore to treat short nails as a preferred option rather than a universal mandate. For a reverse-obliquity fracture with limited distal extension, adequate working length, satisfactory closed or minimally invasive reduction, and stable medial/posteromedial support, the current clinical evidence supports short cephalomedullary fixation and suggests meaningful perioperative advantages. (11,15,17-22) If the fracture extends distally enough to crowd the short-nail locking region, if the pattern is severely comminuted or displaced A3.3, or if intraoperative assessment raises concern regarding construct stability, a mid- or long-length nail is reasonable and biomechanically defensible. (12,13).

Biomechanical Rationale and Working Length

Biomechanical findings clarify why an unqualified "short is always better" conclusion would be inappropriate. Linhart et al. showed that a short PFNA can be mechanically comparable to a long PFNA when the fracture remains 2 cm proximal to the distal locking screw, providing a practical concept of working length. (12) However, Ando et al. demonstrated greater varus-related angular change with a 170-mm nail in an A3.3 synthetic model, suggesting that more severe distal or multifragmentary patterns may benefit from additional intramedullary span. (13) These studies are not contradictory: together they imply that short-nail performance depends on where the fracture terminates relative to the distal fixation and on the severity of the A3 morphology.

Importance of Reduction Quality and Proximal Fixation

Reduction quality appears at least as important as implant length. In the classic series of Haidukewych et al., nonanatomic reduction and poor implant placement were associated with worse outcomes. (3) Honkonen et al. observed only one failure among 47 anatomically or nearly anatomically reduced reverse-obliquity fractures with appropriately positioned cephalomedullary implants, compared with five reoperations among 25 radiographically unacceptable constructs. (5) Hao et al. reported a 13.3% implant-failure rate in A3 fractures treated with PFNA and identified poor reduction quality (odds ratio 28.70) and loss of posteromedial support (odds ratio 18.98) as independent predictors of failure. (8) These effect sizes dwarf the modest and inconsistent associations reported for nail length.

The same principle applies to cephalic fixation. The tip-apex distance remains an established marker of cut-out risk in peritrochanteric fixation, although more recent A3 datasets suggest that traditional radiographic variables may have different predictive performance in reverse-obliquity fractures. (23) Marsillo et al. reported favorable radiographic positioning and lower hemoglobin loss/transfusion with InterTAN in their A3 cohort, while Hammond et al. showed that lag screw sliding can occur with both Gamma and TFNA constructs even when statically locked and is not significantly explained by nail length. (9,16) Thus, changing from a short to a long nail cannot compensate for poor reduction, inadequate cortical support, or suboptimal proximal fixation.

Practical Implications for Short versus Long Nail Selection

The potential disadvantage of short nails that should remain visible in decision-making is peri-implant femoral fracture. In the broad 14,547-patient meta-analysis, long nails were associated with a lower rate of ipsilateral shaft femur refracture. (21) This finding is not A3-

specific and must be weighed against modern implant design and the substantially lower operative burden of short nails. Nevertheless, it supports longer constructs in selected patients with distal fracture propagation, suspicious femoral stress risers, previous implants, or an anatomy in which the short nail would terminate near a vulnerable fracture zone.

Gamma nails deserve specific mention because they are widely used and are represented in contemporary A3 cohorts. The Konda/Hammond work included single-lag-screw cephalomedullary constructs, and Hammond et al. found no significant difference in sliding between Gamma and TFNA devices. (11,16) However, implant family is not interchangeable with implant length: proximal geometry, lag-screw or blade design, distal locking options, nail diameter, and bow differ across Gamma, PFNA, TFNA, InterTAN, and other systems. Therefore, the conclusion of this review should be interpreted as a statement about construct length within modern cephalomedullary fixation, not as proof that all short Gamma/PFNA/TFNA designs behave identically.

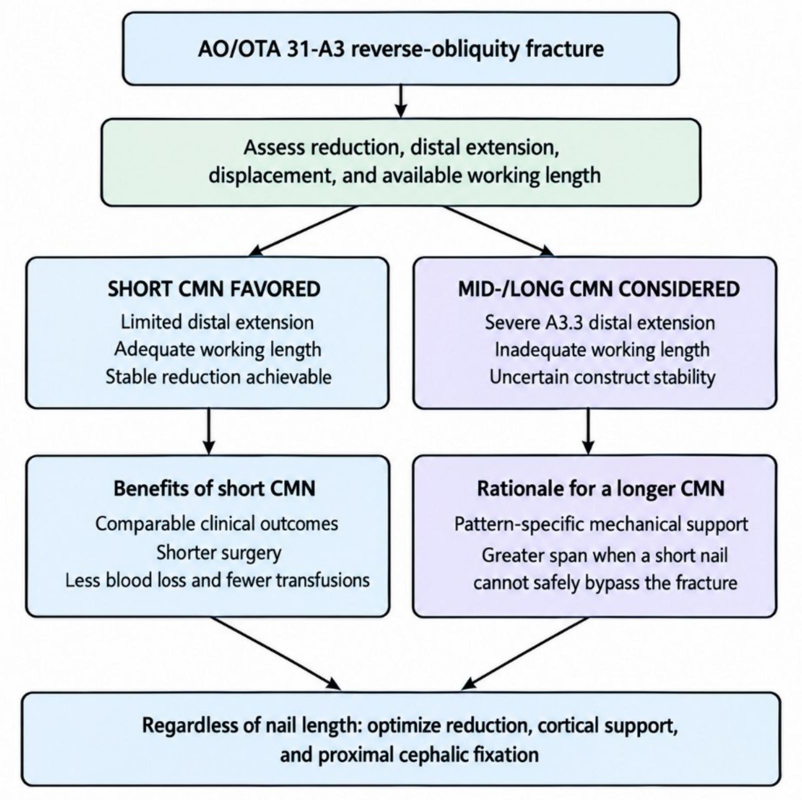

Figure 3. Evidence-informed clinical decision framework for nail-length selection in AO/OTA 31-A3 fractures. This synthesis is not a validated clinical guideline (11-15).

Limitations and Evidence Gaps

Several limitations constrain the strength of the conclusion. First, direct A3-specific clinical evidence remains largely retrospective. Second, surgeon selection bias is difficult to eliminate because longer nails may preferentially be used for more distal, displaced, or otherwise difficult fractures. Third, the two large Breuer reports are related and should not be treated as independent populations. Fourth, short and long nail definitions vary by device family and geography. Fifth, the two biomechanical studies used different fracture geometries and test substrates, explaining some divergence in their conclusions. Finally, the broad systematic reviews that strongly favor short nails for operative efficiency include many A1 and A2 fractures and are therefore supportive rather than definitive for A3 (11-22).

Despite these limitations, the direction of the evidence is clinically coherent. No A3-specific clinical study identified in this review demonstrated a clear healing or revision advantage for routine long-nail use. The strongest direct comparative dataset favored short nails for perioperative parameters without sacrificing measured clinical outcomes, and the largest recent reverse-obliquity cohort explicitly recommended short implants when sufficient working length is present. (11,15) The residual argument for longer implants is pattern-specific and biomechanical, not a blanket consequence of the A3 classification.

Conclusion

For AO/OTA 31-A3 reverse-obliquity intertrochanteric fractures, current evidence is modestly but consistently tilted toward short cephalomedullary nails when fracture morphology permits. In appropriately selected fractures, short nails provide healing, nonunion, reoperation, and mortality outcomes comparable with long nails while reducing operative time, blood loss, and transfusion burden. Long nails should therefore not be considered mandatory solely because a fracture is labeled A3. They remain appropriate when distal/subtrochanteric extension is substantial, working length around the distal locking region is inadequate, severe A3.3 morphology creates instability, or patient-specific factors favor a longer construct. Above all, reduction quality, preservation or restoration of medial/posteromedial support, and correct proximal fixation remain central determinants of success.

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Not declare.

Authorship

All authors meet the ICMJE authorship criteria.

Conflicts of interest

The authors declared no conflict of interest.

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