Stereotactic Radiotherapy Reduces Anti-VEGF Injections for nAMD

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Neovascular age-related macular degeneration (nAMD) necessitates frequent intravitreal anti-vascular endothelial growth factor (anti-VEGF) injections to preserve vision. This regimen imposes a substantial treatment burden on patients and healthcare systems. Extended follow-up data from the STAR trial and a recent meta-analysis indicate that stereotactic radiotherapy (SRT) may reduce the need for these injections over several years.1,2

KEY TAKEAWAYS

- The Pivot: Stereotactic radiotherapy offers a potential adjunctive treatment to reduce the long-term anti-VEGF injection burden in nAMD.
- The Data: SRT reduced the mean number of anti-VEGF injections by 4.2 over years 3 and 4 compared to sham.1
- The Action: Clinicians should consider SRT as a treatment option for nAMD, particularly for patients struggling with frequent anti-VEGF injection schedules.

Neovascular age-related macular degeneration (nAMD) remains a leading cause of severe vision loss globally. Current standard of care involves regular intravitreal injections of anti-VEGF agents, which effectively manage disease activity but require lifelong administration. The frequency of these injections presents a significant challenge, leading to potential patient non-adherence and increased healthcare resource utilisation. Investigating therapies that can reduce this treatment burden while maintaining visual outcomes is therefore a clinical priority.1,2

The STAR Trial and Extended Follow-up

The StereoTactic radiotherapy for wet Age-Related macular degeneration (STAR) trial was a randomised, double-masked, sham-controlled, device trial designed to assess the efficacy and safety of stereotactic radiotherapy (SRT) as an adjunctive treatment for nAMD. The initial primary outcome assessed effects up to two years. Extended follow-up results, published in 2026, provide data for years 3 and 4.1

The STAR trial enrolled 411 participants with nAMD, randomising them to receive either a single dose of SRT (16 Gy) or a sham procedure. All participants continued to receive anti-VEGF injections as needed, based on standardised retreatment criteria. The primary objective of the extended follow-up was to assess the effects of SRT on anti-VEGF injection frequency and visual acuity beyond the initial two-year period.1

Over years 3 and 4, participants in the SRT group received a mean of 4.2 fewer anti-VEGF injections compared to the sham group (95% CI 3.1 to 5.3, $p < 0.001$). This reduction in injection burden was consistent with the benefits observed

in the earlier phases of the trial. The mean number of injections in the SRT group was 5.8 over years 3 and 4, compared to 10.0 in the sham group. Visual acuity outcomes, measured by best-corrected visual acuity (BCVA), remained comparable between the two groups, with no statistically significant difference observed (mean difference 0.5 letters, 95% CI -1.2 to 2.2, P = .56).1

Safety data from the extended follow-up showed no new safety concerns. The incidence of radiation retinopathy remained low, consistent with previous reports, and there were no significant differences in other ocular adverse events between the SRT and sham groups.1

Systematic Review and Meta-Analysis

A systematic review and meta-analysis published in 2026 further evaluated the role of radiotherapy for nAMD, including data from the STAR trial. This analysis aimed to provide a comprehensive overview of the evidence base for various radiotherapy modalities in nAMD treatment.2

The meta-analysis included seven randomised controlled trials, encompassing a total of 1,250 patients. The pooled analysis demonstrated a significant reduction in anti-VEGF injection frequency in patients treated with radiotherapy compared to control groups (Hazard Ratio 0.68, 95% CI 0.59 to 0.79, $p < 0.001$). This effect was consistent across different radiotherapy techniques, including SRT. Visual acuity outcomes were generally maintained, with no significant difference in BCVA change from baseline between radiotherapy and control groups (mean difference 0.2 letters, 95% CI -0.8 to 1.2, P = .70). The meta-analysis also confirmed the acceptable safety profile of radiotherapy, with a low incidence of severe adverse events.2

Limitations of the STAR trial extended follow-up include its single-centre nature for the extended period, which may limit generalisability, although the initial trial was multicentre. The meta-analysis, while comprehensive, is limited by the heterogeneity of included studies regarding radiotherapy doses and techniques. Both studies highlight the need for further research into optimal patient selection and long-term safety monitoring for SRT in nAMD.1,2

Clinical Implications and Future Directions

The consistent reduction in anti-VEGF injection burden observed in the STAR trial's extended follow-up and corroborated by the systematic review and meta-analysis suggests that SRT could represent a valuable adjunctive therapy for nAMD. By significantly decreasing the need for frequent intravitreal injections, SRT has the potential to improve patient adherence, reduce treatment burden, and optimise healthcare resource utilisation. This could translate into better long-term visual outcomes for patients, particularly those who struggle with the demands of current anti-VEGF regimens.

Future research should focus on identifying specific patient subgroups most likely to benefit from SRT, perhaps through biomarker analysis or detailed lesion characteristics. Further investigation into the optimal timing of SRT administration relative to anti-VEGF initiation, as well as the potential for combination therapies with novel anti-angiogenic agents, will also be crucial. Long-term safety data beyond four years will be essential to fully understand the risk-benefit profile of SRT in nAMD management.

CLINICAL IMPLICATIONS

The extended follow-up of the STAR trial, corroborated by a recent meta-analysis, provides compelling evidence that stereotactic radiotherapy can significantly reduce the anti-VEGF injection burden for patients with neovascular AMD. A reduction of 4.2 injections over two years (years 3 and 4) is not trivial; it represents a tangible decrease in clinic visits, patient discomfort, and the logistical strain on ophthalmology departments. This could be particularly impactful for patients who struggle with adherence to frequent injection schedules or those with limited access to specialist care.

From a clinical perspective, the maintenance of visual acuity outcomes alongside this reduced injection frequency is crucial. It suggests that SRT acts as a true adjunctive therapy, allowing for a less intensive anti-VEGF regimen without compromising efficacy. This evidence should prompt a re-evaluation of treatment pathways for nAMD, potentially integrating SRT earlier in the disease course for suitable candidates. The acceptable safety profile, with no new concerns emerging in the extended follow-up, further supports its consideration.

The industry implications are also noteworthy. While anti-VEGF agents like aflibercept and ranibizumab remain the cornerstone of nAMD treatment, the introduction of SRT as a burden-reducing therapy could shift market dynamics. Device manufacturers offering SRT solutions may see increased adoption, particularly as healthcare systems seek efficiencies and patient-centric solutions. This development underscores the ongoing evolution in ophthalmology, where combination therapies and novel delivery methods are increasingly explored to optimise patient outcomes and quality of life.

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REFERENCES

1. 1. Jackson TL, Desai R, Wafa HA. Stereotactic radiotherapy for neovascular age related macular degeneration: year 3 and 4 extended follow up results of a randomised, double masked, sham controlled, device trial (STAR). BMJ. 2026. doi:10.1136/bmj-2026-729694
2. 2. Lei Y, Yang J, Li Y. Radiotherapy for Neovascular Age-Related Macular Degeneration: A Systematic Review and Meta-Analysis. Curr Eye Res. 2026. doi:10.1080/02713683.2026.2621179

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