International Journal of
Cancer Care and Delivery

Conference Abstracts
Vol. 6, Issue Supplement 2, 2026

3D/4K Digital Exoscope versus Conventional Operative Microscope for Glioblastoma Resection: A Systematic Review of Comparative Clinical Studies

Sarbagya Ratna Khatiwada, MBBS[1,a]; Aakash Shah, MBBS[2]; Bibha Osti, MBBS[3]

[1] Dhulikhel Hospital, Kathmandu University Hospital, Dhulikhel, Bagmati, Nepal
[2] Kathmandu University, Dhulikhel, Bagmati, Nepal
[3] Patan Academy of Health Sciences, Lalitpur, Bagmati, Nepal

Corresponding author
[a] Sarbagya Ratna Khatiwada, MBBS, Dhulikhel Hospital, Kathmandu University Hospital, Dhulikhel, Bagmati, Nepal
Email: sarbagyakhatiwada2080@gmail.com

Keywords: 3D exoscope, Glioblastoma Resection, Exoscope vs Microscope
Submission received: 2026-08-28 / Accepted: 2026-08-30 / Published: 2026-09-11
https://doi.org/10.53876/001a.129903

Abstract

Background

Is digital exoscope any beneficial over conventional operative microscope for glioblastoma resection? To compare the digital exoscope with that of a conventional microscope in glioblastoma resection in terms of simplicity, visualization, magnification, comfort , learning curve, operative time and depth perception this study was done.

Methods

The systematic review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses 2020 guidelines. A systematic search of the electronic databases PubMed, Science Direct and Google Scholar were done from database inception to 25th August 2026 using the key words 3D-Exoscope, Glioblastoma Resection, Conventional Microscope. Reference list of the included studies was screened for any eligible records. Studies which evaluated 3D exoscope and conventional Microscope for Glioblastoma resection were eligible. Quality assessment was done using Risk of Bias 2 tool, Newcastle–Ottawa Scale and Joanna Briggs institute critical appraisal tool for RCTs, cohort studies and non-randomized studies respectively. A narrative synthesis was done from the included studies.

Results

A total of 484 studies were imported based on search and 11 were included for the review by two independent reviewers. The gross total resection rate was higher in the exoscope group than in the microscope group. Median progression-free survival (PFS) same in both groups and median overall survival (OS) was high in the exoscope group . Operative time was significantly longer in the microscope group. Postoperative neurological complications such as paresis or aphasia were significantly lower in the exoscope group. Patients operated on with the exoscope had a longer PFS (Progression Free Survival) whereas Overall Survival (OS) were almost the same. User friendly simplicity, improved strong visualization, enhanced magnification, higher comfort for surgeons. lack of depth perception, need for short learning curve, increased workflow and operative time , comparable inferiority in depth perception were

the short comings were significant outcomes of all the eligible studies.

Conclusion

The 3D exoscope is better than conventional microscope in resection of Glioblastoma in aspects of Progression free survival, Visualization of tumor, improved surgical manipulation, simplicity , comfort for surgeons although it has its own shortcomings such as lack of depth perception, need for short learning curve, increased workflow and operative time, inferiority in depth perception.

© 2021–2026 Binaytara. Website design and layout all rights reserved. Articles published in the International Journal of Cancer Care and Delivery are open access. Authors retain copyright. All articles are distributed under the terms of the Creative Commons Attribution-ShareAlike 4.0 International (CC BY-SA 4.0) license, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited and derivative works are shared under the same license.