Exoscope Use in Head & Neck Reconstructive Surgery, First Impressions

Gabriel Pujol, MD[1], Adam Jacobson, MD[1], Nupur Bhatt, MD[1], Jamie Levine, MD[1], Angela Volk, MD[1], Amy Yao, MD[1]

[1]NYU Langone Health, New York, NY, USA

INTRODUCTION

- Exoscopic magnification during surgery aims to improve microscopic detail, image quality, and physician comfort during microscopic surgery.
- Additionally, exoscopic magnification allows the entire surgical team to experience three-dimensional magnification via 3-D glasses and monitors. This may be an additional benefit at academic institutions.
- This study aims to describe the benefits and disadvantages of using an exoscope during head & neck microvascular surgery.

METHODS

- Prospective descriptive study.
- An exoscope was used as a source of magnification in all head & neck microvascular surgeries done at a single institution during a period of 3 months.
- The Mitaka HawkSight 4K3D exoscope served as the source of magnification.
- Exoscopic magnification was used during preparation of flap and neck vessels, arterial anastomosis, and venous anastomosis.
- Five operating surgeons relayed their experience using exoscopic magnification.
- A brief and simple questionnaire was developed to gauge each surgeon's experience using the exoscope.
- The questionnaire was answered by each surgeon after the 3-month period.
- Metrics reviewed by the operating surgeons were overall experience, comfort level, picture quality, and likeliness of using the exoscope in the future.
- Surgeons were also asked to report on advantages and disadvantages they saw in using an exoscope during microvascular surgery.

Fig. 1. Mitaka HawkSight 4K3D Exoscope

Surgeon Questionnaire

1. How would you rate your experience using the Exoscope as a magnification device during microvascular surgery?
   - Possible answers: Positive, Negative, or Neutral
2. How would you describe the magnified picture quality of the Exoscope compared to a traditional operating microscope when used during microvascular surgery?
   - Possible answers: Better, Worse, or Same
3. How would you compare the comfort of the physician's position during microvascular surgery when using the Exoscope versus a traditional operating microscope as a magnification device?
   - Possible answers: Better, Worse, or Same
4. Would you use the Exoscope during microvascular surgery again?
   - Possible answers: Yes or No

RESULTS

Table 1: Surgeon Exoscope Questionnaire answers.

Surgeon	Experience	Picture Quality	Comfort	Would Use Again
1	Positive	Same	Better	Yes
2	Positive	Worse	Better	Yes
3	Positive	Worse	Better	Yes
4	Positive	Same	Better	Yes
5	Positive	Worse	Better	Yes

Table 2: Advantages and disadvantages of exoscopic magnification during microvascular surgery

Advantages	Disadvantages
• Three-dimensional magnification for the entire operating team. • Increased ergonomics. • Easy to use. • Less cumbersome than a standard operating microscope. • Increased surgeon freedom of motion. • High-quality imaging. • Quick learning curve.	• Decreased picture brightness. • Need for multiple monitors in the operating room.

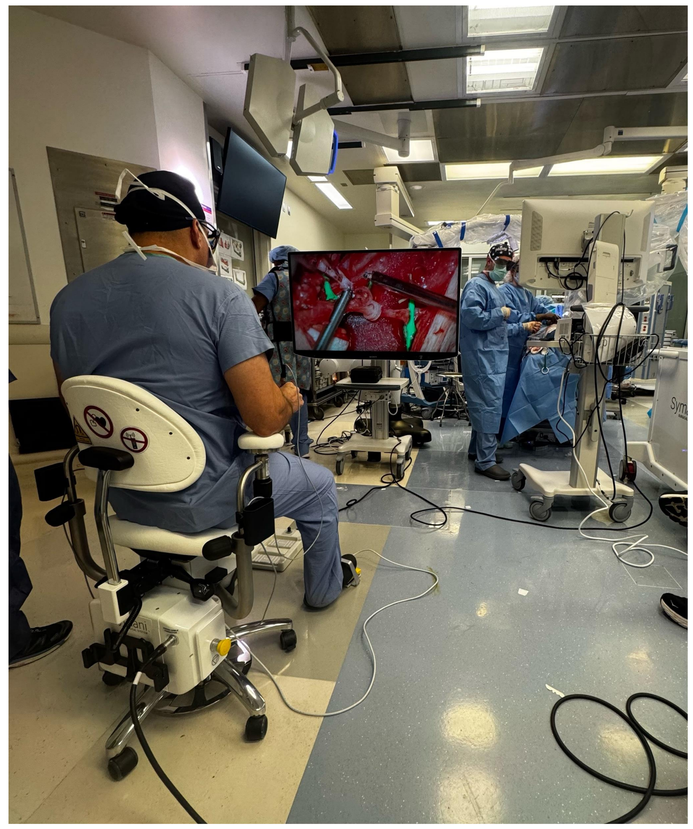

Fig. 2. Exoscopic magnification during microvascular surgery

RESULTS SUMMARY

- The exoscope was used in 24 head & neck reconstructive surgeries.
- Overall experience was rated as positive across all cases.
- Operating surgeons reported increased comfort across all cases.
- Operating surgeons reported that they were likely to use the exoscope again.
- Attractive features reported by the operating surgeons were: allowing the entire surgical team to experience magnification, improved ergonomics, ease of use, less cluttered surgical field, increased surgeon freedom of motion, increased maneuverability of imaging angle, and high-quality imaging.
- The drawbacks reported by surgeons were decreased picture brightness compared to standard microscopy and the need for multiple monitors in the operating room.

PRELIMINARY CONCLUSIONS

- Initial use of exoscopic magnification in head & neck microvascular reconstruction was met with a positive perception from all involved surgeons.
- Advantages were mostly related to ergonomics and comfort during surgery.
- Future improvements in technology will possibly address some of the drawbacks observed by the surgeons.
- Future studies focused on operating time, surgical outcomes, and physician fatigue during microvascular surgery will help determine the exoscope's role in microvascular head & neck reconstruction.

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