

REVOLUTIONIZING SURGICAL EDUCATION: VIRTUAL PRECEPTORSHIP IN ARTHROSCOPIC ANATOMIC GLENOID RECONSTRUCTION(AAGR)

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Disclosures

Dr. Makena Mbogori & Ms. Sarah Remedios:

- Nothing to disclose.

Dr. Ivan Wong:

Speakers Bureau

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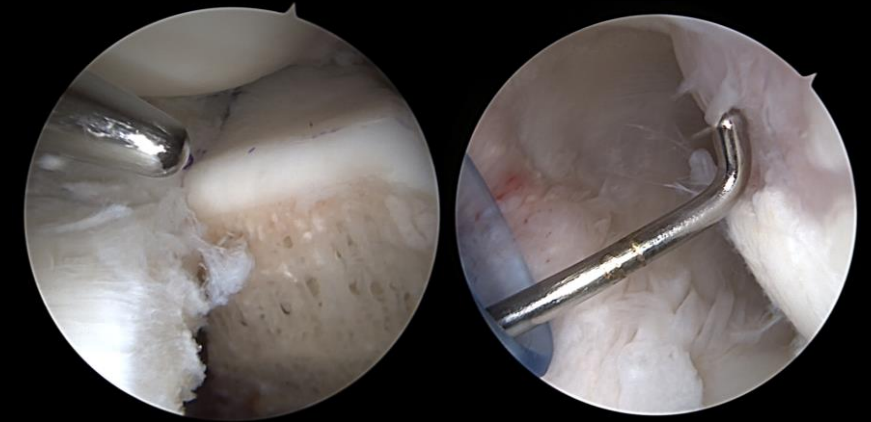
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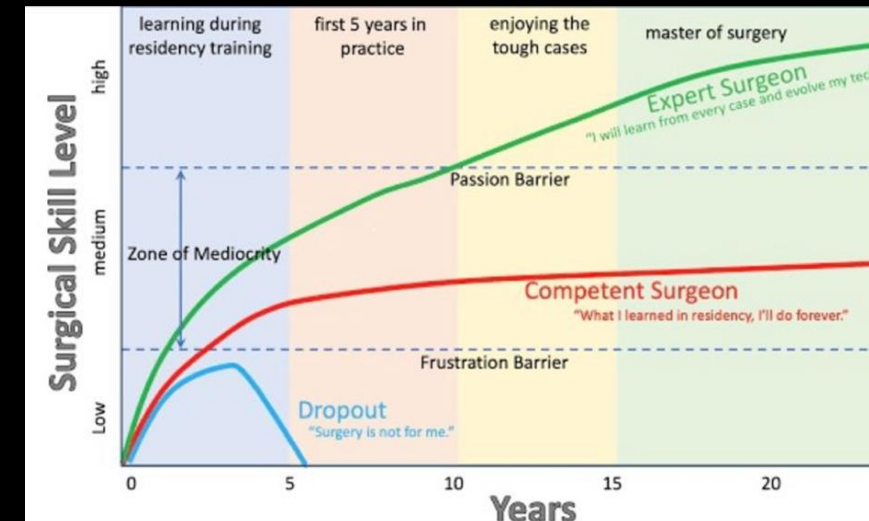
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Introduction

- Recurrent Shoulder Instability is common
 - Bone loss of the glenoid and/or humeral head increases risk of re-dislocation
- Arthroscopic Anatomic Glenoid Reconstruction (AAGR) with Distal Tibia Allograft (DTA) is a novel surgical technique demonstrating an excellent safety profile and clinical outcomes with minimal complications
 - **HOW CAN WE TEACH THIS NOVEL TECHNIQUE???**
- Acquisition of new surgical skills involves
 - Direct training in the OR
 - Surgical Courses
 - Virtual or Simulation Training



Wong & Urquhart, 2015



Telesurgery Mentorship

- Virtual Preceptorship involves
 - Real time, One-on-One interaction between Distant Surgeon and Teaching Surgeon in the Operating Room
 - Visual and Audio Interactions
- Augmented Reality (AR)
 - graphic interfaces over real-world objects
- Mixed Reality (MR)
 - physical and digital elements interact.



Stetson WB et al Arthrosc Tech 2022

Research Question

Is Virtual Preceptorship with Mixed Reality a feasible and effective surgical education method for Arthroscopic Anatomic Glenoid Reconstruction (AAGR) Technique?

Methodology

• PRE-BROADCAST QUESTIONNAIRE

- Learner's professional demographics, Level of shoulder surgical experience, Level confidence and comfortability with shoulder stabilization procedures

• LIVE SURGERY BROADCAST

- Nova Scotia Health OR's; Patient Consenting
- Virtual meeting platform
- Real-time audio and visual feedback
- Use of AR and MR- Hologens, RSQ technologies

• POST- BROADCAST QUESTIONNAIRE

- Level of comfortability with AAGR procedure, Level of satisfaction with Virtual preceptorship for AAGR

OUTCOMES

1. Change in level of comfortability with AAGR pre vs post Virtual Preceptorship
2. Level of Satisfaction with Virtual Preceptorship for AAGR

PRE- BROADCAST QUESTIONNAIRE

- The Distant Learner's are sent a questionnaire prior to the Virtual Preceptorship to illustrate
 - Number of years in practice
 - Number of stabilization surgeries performed per year i.e.
 - Arthroscopic Bankart Repair
 - Arthroscopic or Open Laterjet
 - Other bone block procedures e.g. ICBG etc
 - Level of comfortability/confidence with AAGR with DTA procedure

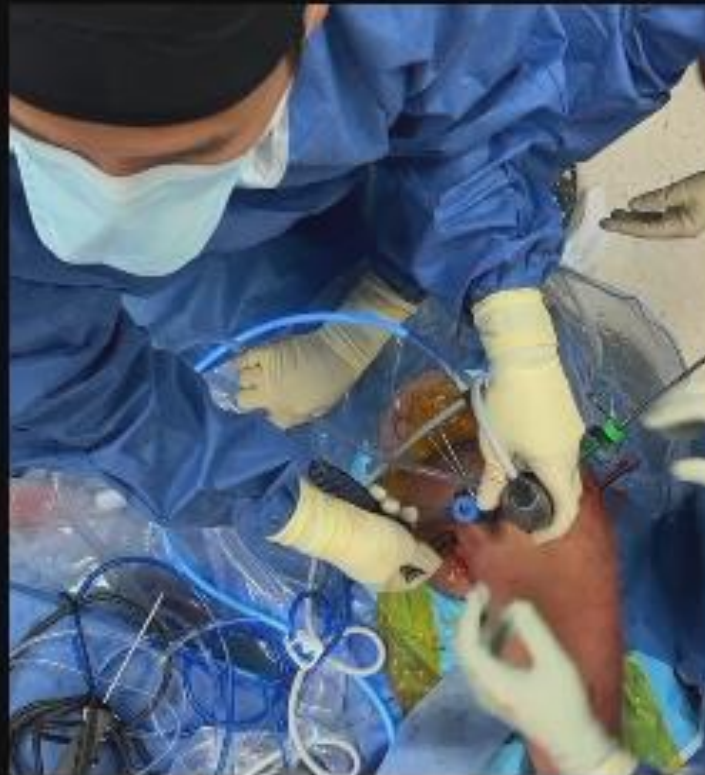
LIVE SURGERY BROADCAST

The Distance Learner experiences this 3 Camera view with real-time audio communication with the preceptor throughout the procedure.

INTRA-ARTICULAR VIEW



OVER-HEAD VIEW



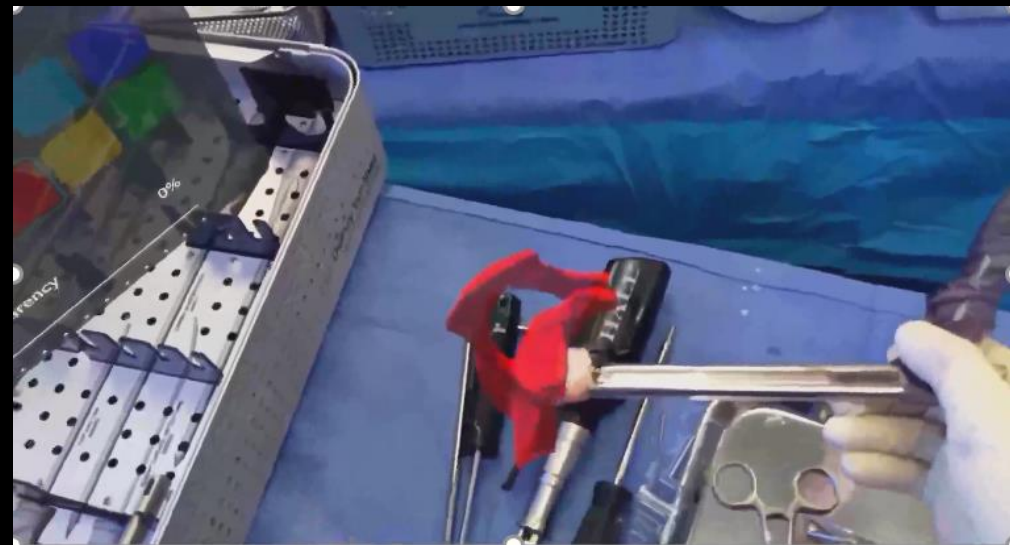
SIDE VIEW



INTRA-OP –AR/MR visualization

Mixed Reality images are broadcasted via a Head Mounted Device worn by the preceptor surgeon

This is an illustration of how the graft preparation can be planned, optimized and anticipated specific to the patient using MR to enhance accuracy and successful positioning.



POST-BROADCAST EVALUATION

- Post-Broadcast Questionnaires to Distant learners
 - Level of Overall Satisfaction
 - Camera Viewing angles
 - Video Quality
 - Ability to answer questions
 - Content of live surgery
 - Ability/Comfortability to perform AAGR

Results

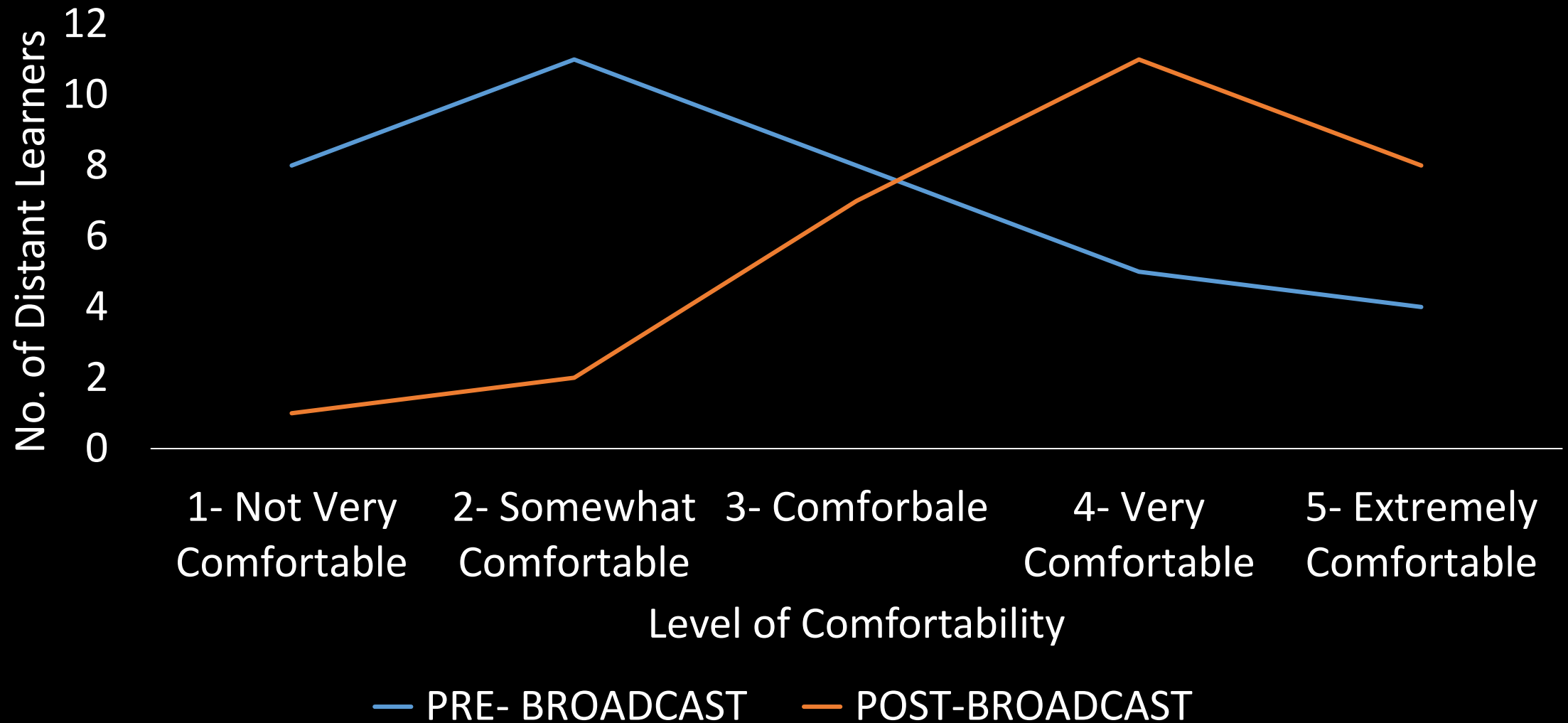
Total No. of Broadcasts - 86 surgeons (Dec 2020-Oct 2023) across US and Canada

No intra-operative surgical complications

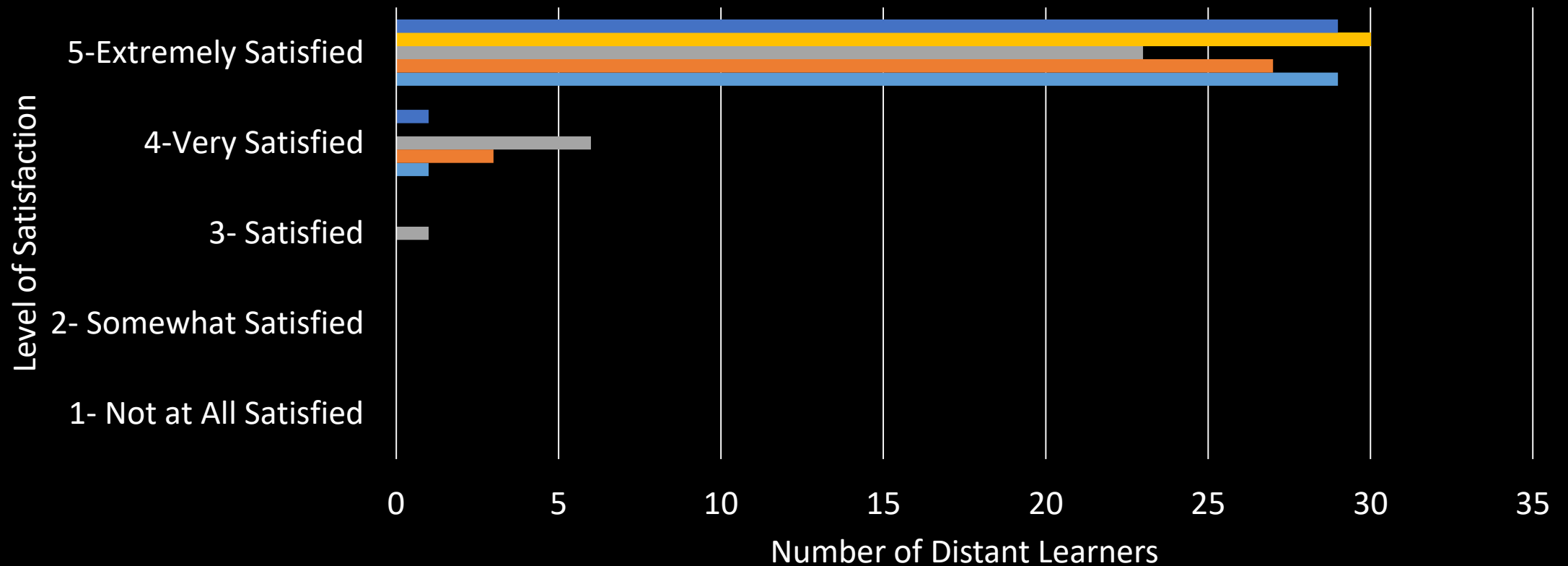
Level of Experience of Distant learner's

- 76% performed >25 Arthroscopic Bankart procedures/year
- 14% perform Arthroscopic Laterjet
- 85% perform Open Laterjet

Level of Comfortability with AAGR Procedure



Level Of Satisfaction Of Broadcast Session



■ CONTENT OF LIVE SURGERY

■ VIDEO QUALITY

■ OVERALL BROADCAST

■ ABILITY TO ASK/ANSWER QUESTIONS

■ CAMERA VIEWING ANGLES

Strengths & Limitations

• STRENGTHS

- Real time correspondence with learner's
- One on One interaction
- Multiple Camera Views
- AR & MR

• LIMITATIONS

- Internet Connectivity fluctuations
- Technical issues
- Low response rate to post-broadcast questionnaires

Conclusion

Virtual Preceptorship is a viable surgical education tool with high satisfaction rates among learners

- multiple camera views
- real-time visual and audio feedback
- AR & MR

Further objective studies are required to assess adoptability, utilization, efficiency and clinical outcomes.

Significance

- Virtual Preceptorship can be an effective tool for acquisition and teaching of new surgical skills not only in residency, but also during transition and advancement in clinical practice
- Breaking down geographical barriers to surgical education can contribute to the enhancement of global surgery.
- Allows industry representatives remote access to surgeons in the operating room, streamlining product education, training and introduction of new technologies.

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