



TRUDI stereotactic navigation system for orbital decompression surgery: A case series

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INTRODUCTION

Thyroid eye disease (TED) is a debilitating autoimmune condition characterized by inflammation and expansion of orbital tissues resulting in proptosis, diplopia, and optic neuropathy. Orbital decompression surgery plays a major role in management of TED refractory to medical management.

Surgical image-guided navigation systems have become increasingly used in orbital decompression surgery, improving precision and minimizing complications².

The TRUDI stereotactic navigation system (Acclarent, Irvine, CA), released in 2018, has several potential advantages over the prior established StealthStation navigation system that was FDA approved in 1996 (Medtronic, Minneapolis, MN). These advantages include the lack of need for adhesive skin markers, the design of a field generator as a pillow, and AI powered anatomical alerts.¹⁻⁴

OBJECTIVE

This is the first case series to describe the use of TRUDI versus the prior established StealthStation system in orbital decompression surgery for refractory TED



Figures A, C: TRUDI system; Figures B, D: StealthStation system

REFERENCES

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2. Heisel CJ, Tuohy MM, Riddering AL, Sha C, Kahana A. Stereotactic Navigation Improves Outcomes of Orbital Decompression Surgery for Thyroid Associated Orbitopathy. *Ophthalmic Plast Reconstr Surg*. 2020 Nov/Dec;36(6):553-556. doi: 10.1097/IOP.0000000000001630. PMID: 32134770.
3. Acclarent (Johnson & Johnson) press releases describing the launch of TruDi with AI-powered TruSeg and TruPath (2018-2021), highlighting fiducial-free operation and automated segmentation/pat planning. <https://www.mpo-mag.com/breaking-news/jjs-acclarent-launches-ai-powered-ent-navigation-tech/>.
4. About TruDi Navigation system. <https://7157e75ac0509b6a8f5c-5b19c577d01b9ccfe75d2f9e4b17ab55.ssl.cf1.rackcdn.com/RYRHJNM-PDF-2-445963-4427157448.pdf>

Outcome/characteristic	StealthStation (n=7)	TRUDI (n=8)
Smokers	62.5%	57.1%
Diabetes	37.5%	28.6%
Hypertension	37.5%	42.9%
Mean pre-operative exophthalmometry (mm)	23.9	23.9
Mean post-op exophthalmometry (mm)	21.7	21.8
Mean operative time (minutes)	116 ± 29	105 ± 25
Intra- or post-operative complications	0	0

Table 1. Patient characteristics and surgical outcomes

METHODS

A single-center surgeon group retrospective chart review was performed on TED patients who underwent orbital decompression with Stealthstation or TRUDI.

Indications were proptosis, lagophthalmos, and exposure keratoconjunctivitis.

Patients with previous orbital or eyelid surgeries were excluded.

Data reviewed included patient and surgical characteristics, as well as 1-month post-op clinical outcomes.

RESULTS

The sample consisted of 10 patients, 80% female, with median age of 50 years. 5 patients underwent surgery with TRUDI in one eye and StealthStation in the other eye, 2 underwent TRUDI assisted surgery in only one eye, and 3 underwent StealthStation assisted surgery in only one eye.

TRUDI-assisted surgeries had slightly shorter operative times, and neither group experienced any intra-operative or immediate post-operative complications (Table 1).

CONCLUSION

The TRUDI navigation system provides a simplified, more efficient workflow compared with StealthStation, which may improve surgeon efficiency and reduce operative time. Shorter operative time and reduced time under anesthesia may decrease risk of complications, operative costs, and improve outcomes.

The current case series is limited by small sample size, and additional research is needed to validate our findings on the benefit of TRUDI in orbital decompression surgery.