

Considerations for Hemostasis in Oculoplastic Surgery

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Disclosures

- ▶ No financial disclosures

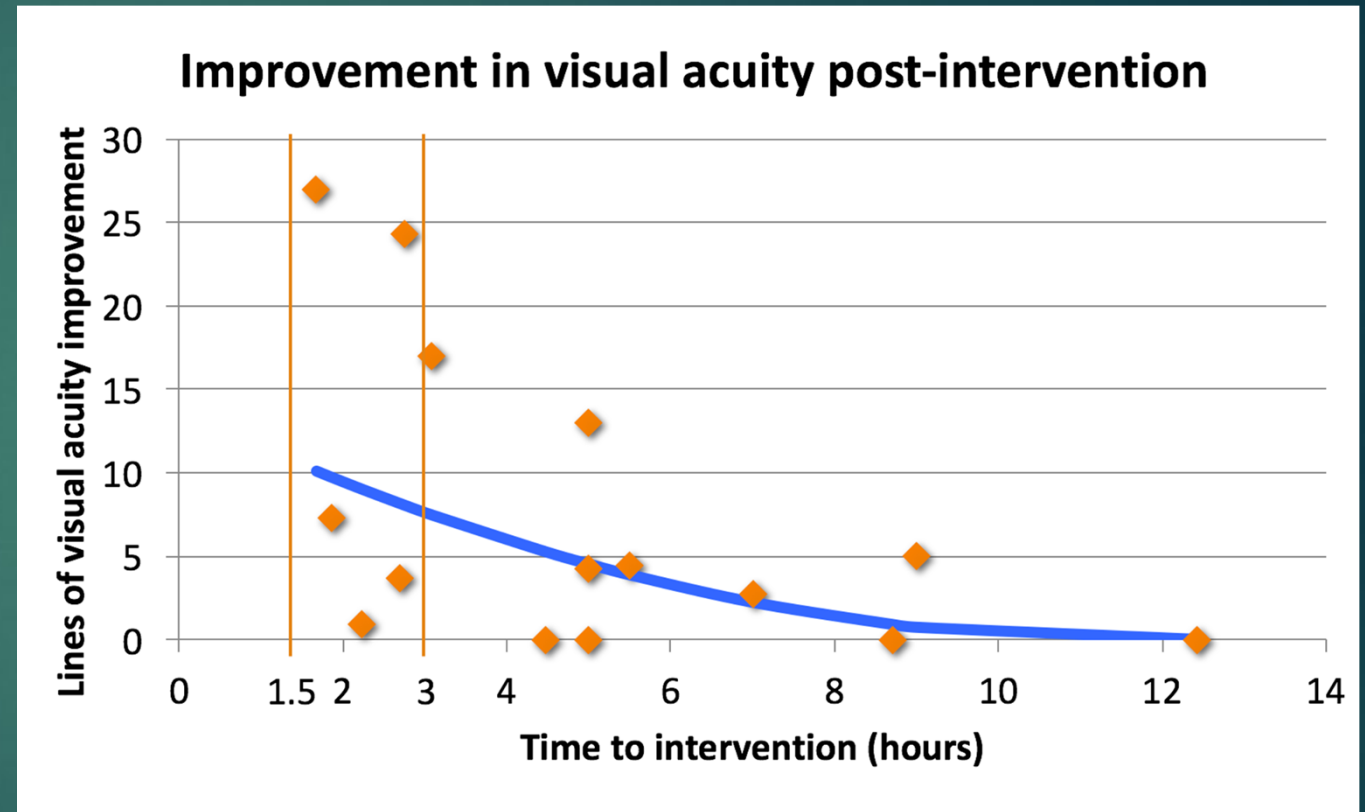
About Me

- ▶ Undergraduate at Stanford University
- ▶ Medical school at Columbia University
- ▶ MPH in Quantitative Methods from Harvard School of Public Health
- ▶ Ophthalmology residency at UT Houston
- ▶ Oculoplastic fellowship at Central Valley Eye in Stockton, CA
- ▶ Golden Retriever named Winston



Why is intraoperative hemostasis important?

- ▶ Beyond bruising and swelling which is bothersome to the patient, bleeding that extends posteriorly into the orbit (retrobulbar hemorrhage) can result in vision loss due to orbital compartment syndrome
- ▶ Recognition of the compartment syndrome and quick intervention to prevent vision loss is essential



When to think about potential issues with hemostasis?

- ▶ Pre-operative
- ▶ Intra-operative
- ▶ Post-operative

When to think about potential issues with hemostasis?

- ▶ **Pre-operative**

Patient Scenario

- ▶ 65 year-old woman presenting for oculoplastic surgery evaluation
 - ▶ What kind of surgery?
 - ▶ Nasolacrimal probe vs Eyelid (upper or lower) vs orbital
 - ▶ Medical history
 - ▶ History of cancer, bleeding disorder, heart disease, or stroke
 - ▶ Taking any blood thinners at home?
 - ▶ When was her last stroke or heart attack?
 - ▶ History of issues with bleeding in any other procedures?
(including blood draws)

Types of oculoplastic surgery and bleeding risk

- ▶ Low risk:
 - ▶ Chalazion, eyelid lesion removal, upper lid blepharoplasty (skin only)
- ▶ Moderate risk:
 - ▶ External ptosis repair, lower lid blepharoplasty, DCR
- ▶ High risk:
 - ▶ Deep orbital surgery (tumors, decompressions, fracture repairs, etc)
- ▶ Vision loss from postoperative retrobulbar hemorrhage varies from 0.0045% for blepharoplasty¹ to 0.24% in orbital surgery²

1- Hass AN, Penne RB, Stefanyszyn MA, et al.. Incidence of postblepharoplasty orbital hemorrhage and associated visual loss. *Ophthalmic Plast Reconstr Surg*. 2004;20:426–432.

2- Jacobs SM, McInnis CP, Kapeles M, et al.. Incidence, risk factors, and management of blindness after orbital surgery. *Ophthalmology*. 2018;125:1100–1108.

3 - Makuloluwa AK, Tiew S, Briggs M. Peri-operative management of ophthalmic patients on anti-thrombotic agents: a literature review. *Eye (Lond)*. 2019;33:1044–1059.

Anti-thrombotic agents

- ▶ Practice patterns vary as far as whether/when to stop various agents

Patient risk of thromboembolism	Surgery bleeding risk		
	Minimal (chalazion, eyelid lesion)	Mild (eyelid and brow surgery)	High (lacrimal, orbital, facelift surgery)
Low	Continue all medications	Stop all medications	Stop all medications
High	Continue all medications	Stop DOAC Stop warfarin and bridge with LMWH Continue Aspirin if possible	Stop DOAC Stop warfarin and bridge with LMWH Stop Aspirin

When to stop Anti-thrombotic agents

TABLE 5.

When to stop blood thinners before surgery

Class	Agent	Time to peak effect	When to stop before surgery	Elimination half life
Antiplatelet	Aspirin	5–30 min	7–10 days ^{56,57}	0.25 hours
	Clopidogrel	0.75 hours	5 days ^{56,57}	6 hours
Anticoagulant	Warfarin	72–96 hours	3–5 days	20–60 hours
	LMWH	3–5 hours (enoxaparin)	24 hours ⁵⁸	4.5–7 hours
DOAC	Dabigatran	1–3 hours	1–5 days ^{*58}	8–15 hours
	Apixaban	2–4 hours	24–48 hours ⁵⁸	7–11 hours
	Rivaroxaban	1–2 hours	24–48 hours ⁵⁸	12 hours
	Edoxaban	1–2 hours	24–48 hours ⁵⁸	10–14 hours
	Betrixaban	3–4 hours	96 hours	19–27 hours

Anti-thrombotic agents

- ▶ On the other hand, if unable to stop anti-thrombotic agents before surgery, can take into account the patient's surgical bleeding risk to decide if safe to proceed without stopping them
- ▶ Prospective study
 - ▶ Bleeding prolonged surgery in 9.2%
 - ▶ Little correlation between severity of bleeding intraop and postop bruising
 - ▶ No patients with permanent sequelae related to hemorrhage, however incidence of RBH is low
 - ▶ 2 had postop systemic complications likely 2/2 withholding antithrombotics prior to surgery

OTC supplements that may increase bleeding risk

- ▶ Vitamin E
- ▶ Fish Oil/Omega 3
- ▶ Ginger
- ▶ Ginseng
- ▶ Ginkgo biloba
- ▶ Garlic
- ▶ Selenium
- ▶ Onion
- ▶ Green tea
- ▶ Chondroitin
- ▶ Licorice
- ▶ Capsaicin
- ▶ Grape seed extract
- ▶ Turmeric
- ▶ Evening primrose
- ▶ St. John's wort
- ▶ Celery
- ▶ Feverfew

Kim C, Pfeiffer ML, Chang JR, Burnstine MA. Perioperative Considerations for Antithrombotic Therapy in Oculofacial Surgery: A Review of Current Evidence and Practice Guidelines. *Ophthalmic Plast Reconstr Surg*. 2022 May-Jun 01;38(3):226-233. doi: 10.1097/IOP.0000000000002058. Epub 2022 Jan 11. PMID: 35019878; PMCID: PMC9093724.

Ing E, Douketis J. New oral anticoagulants and oculoplastic surgery. *Can J Ophthalmol*. 2014;49:123-127.

When to think about potential issues with hemostasis?

- ▶ Pre-operative
- ▶ **Intra-operative**

Intra-operative Management of Hemostasis

- ▶ Local anesthesia mixed with epinephrine
- ▶ Positioning – reverse Trendelenburg
- ▶ Controlled hypotension?
 - ▶ Reduction of systolic blood pressure to 80-90mmHg, MAP to 50-65 mmHg
 - ▶ Used more in orthopedic, OMFS, ENT, neurosurgical, urologic, spinal procedures.

Vagefi, M. Reza, et al. "Local anesthesia in oculoplastic surgery." *Archives of Facial Plastic Surgery* (2008).

Sia, David Ik Tuo, et al. "General anaesthetic considerations for haemostasis in orbital surgery." *Orbit* 33.1 (2014): 5-12.

Tan, P., W. F. Siah, and R. Malhotra. "Methods for prevention of complications during eyelid and peri-orbital surgery." *Expert Review of Ophthalmology* 11.4 (2016): 311-319.

IV Ketorolac

- ▶ Ketorolac has been shown to decrease opioid requirement and reduce post-op pain
- ▶ Retrospective review of 111 patients undergoing lacrimal or orbital surgery
- ▶ 31 received IV ketorolac, 80 patients did not
- ▶ No major bleeding events occurred - however not statistically significant and these events are rare
- ▶ No significant difference in grade of bruising after procedure between the two groups ($p=0.08$)

Chang, Minwook, et al. "Does intraoperative ketorolac increase bleeding in oculoplastic surgery?." *Ophthalmic Plastic and Reconstructive Surgery* 36.4 (2020): 355-358.

Wladis, Edward J., Katherine W. Lee, and Arup De. "Intravenous ketorolac reduces pain score and opioid requirement in orbital surgery." *Ophthalmic Plastic & Reconstructive Surgery* 36.2 (2020): 132-134.

Tranexamic Acid (TXA)

- ▶ Synthetic derivative of lysine with antifibrinolytic effect
- ▶ Increasingly popular in aesthetic plastic surgery to reduce intraoperative blood loss, postop edema and ecchymosis.

- ▶ Randomized double-blind, prospective study with groups receiving a preoperative local injection of lidocaine mixed with TXA or saline
- ▶ Patients had stopped antithrombotics 1 week prior
- ▶ Trend to less bruising in the TXA group but otherwise no significant difference in amount of bleeding

When to think about potential issues with hemostasis?

- ▶ Pre-operative
- ▶ Intra-operative
- ▶ **Post-operative**

Post-operative instructions

- ▶ No heavy lifting (>5-10 pounds), bending over
- ▶ Elevate the head while sleeping
- ▶ Ice compresses
- ▶ Some recommend Arnica montana but data does not clearly support

Kotlus BS, Heringer DM, Dryden RM. Evaluation of homeopathic Arnica montana for ecchymosis after upper blepharoplasty: a placebo-controlled, randomized, double-blind study. *Ophthalmic Plast Reconstr Surg*. 2010;26:395-397.

When to restart antithrombotics

- ▶ Antiplatelets:
 - ▶ That evening if no significant bleeding
- ▶ NOAC:
 - ▶ 24hrs if low-risk, 2-3 days if high risk
- ▶ Warfarin:
 - ▶ That evening if no significant bleeding

Kozek-Langenecker SA, Ahmed AB, Afshari A, et al.. Management of severe perioperative bleeding: guidelines from the European Society of Anaesthesiology: first update 2016. *Eur J Anaesthesiol.* 2017;34:332–395.

Ing E, Douketis J. New oral anticoagulants and oculoplastic surgery. *Can J Ophthalmol.* 2014;49:123–127.

Schulman S, Hwang HG, Eikelboom JW, et al.. Loading dose vs. maintenance dose of warfarin for reinitiation after invasive procedures: a randomized trial. *J Thromb Haemost.* 2014;12:1254–1259.

Risk of delayed retrobulbar hemorrhage

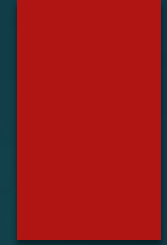


Table 1. Details of hemorrhagic events.

Patient	Age/ Sex	Procedure	Anticoagulant Resumed	Time of Hemorrhage	Anticoagulant Agent, Indication	Intervention
1	80/F	Internal ptosis repair (MMCR)	Post-op day 1	Post-op day 3	Apixaban (Eliquis) for AFib	Pressure patch for 24 h
2	87/F	Repair of eyelid lacerations	Post-op day 4	Post-op day 4	Apixaban (Eliquis) for AFib	1 U PRBC, return to OR for cauterization
3	71/F	Endoscopic DCR	Post-op day 1	Post-op day 5	Warfarin for AFib and prosthetic mitral valve (bridged with enoxaparin)	Return to OR, cauterization of bleeding mucosa
4	76/ M	Lower lid tightening and sub-orbicularis oculi fat lift	Post-op day 2	Post-op day 2	Aspirin and Apixaban (Eliquis) for AFib	Bedside wound revision and cautery
5	75/F	Upper blepharoplasty and MMCR	Post-op day 1	Post-op day 6 (elevated BP)	Warfarin for AFib and prosthetic aortic valve (bridged with enoxaparin)	3 U FFP, Vitamin K, return to OR for cauterization
6	80/F	Lower lid entropion repair	Post-op day 4	Post-op day 6 (elevated BP)	Aspirin for s/p aortic aneurysm repair	Return to OR for cauterization
7	55/ M	Upper lid wedge excision and lower lid lateral tarsal strip	Post-op day 1	Post-op day 2	Aspirin and Rivaroxaban (Xarelto) for AFib and CAD s/p bare metal stent	Bedside wound revision with Surgicel application

AFib, atrial fibrillation; PRBC, packed red blood cells; BP, blood pressure; FFP, fresh frozen plasma; CAD, coronary artery disease.

Conclusion

- ▶ We can balance of risk of thromboembolism with the risk of surgical bleeding for each individual case - does not have to be all or none
- ▶ Overall, the risk of retrobulbar hemorrhage is low but the potential repercussions can be severe, leading to blindness

Thank you!

