

Trabeculoplasty and Trabeculectomy, Laser

ACG: A-0196 (AC)

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Clinical Indications for Procedure

- Laser trabeculoplasty or trabeculectomy may be indicated for **1 or more** of the following(1)(2)(3):
 - Adult open-angle glaucoma (primary, secondary, or suspect) and **1 or more** of the following(3)(15)(16)(17)(18):[N](#)
 - Need for primary surgical intervention(5)
 - Optic nerve damage continues despite reaching intraocular pressure goals.
 - Patient declines, is intolerant of, or is unable to adhere to medical therapy.(6)(22)
 - Target intraocular pressure cannot be reached medically.(23)
 - Pediatric glaucoma and **1 or more** of the following[A](24)(25)(26)(27):[N](#)
 - Need for primary surgical intervention (ie, congenital aniridia without cataract, primary childhood glaucoma)
 - Target intraocular pressure cannot be reached medically.

Alternatives to Procedure

- Alternatives include(1)(3)(31):
 - Conventional trabeculectomy
 - Pharmacotherapy(5)(9)(10)(18)

Evidence Summary

Background

Laser trabeculoplasty and trabeculectomy, like all current treatments of primary open-angle glaucoma, are aimed at reducing intraocular pressure.(2)(4)(5)(6)(7) **(EG 2)** Elevated intraocular pressure is an important risk factor for primary open-angle glaucoma and is currently the only modifiable causative factor for that disease.(4) **(EG 2)** Laser trabeculoplasty causes coagulative thermal damage to the trabecular meshwork, which lowers intraocular pressure by an unclear mechanism.(8)(9)(10) **(EG 2)** Selective laser trabeculoplasty uses a special lower-energy laser that is thought to be selectively absorbed by pigmented cells in the trabecular network, possibly causing less thermal damage as compared with argon laser trabeculoplasty.(9)(10)(11)(12)(13) **(EG 2)** Trabeculectomy reduces intraocular pressure by providing an alternate path for aqueous fluid drainage.(2)(14) **(EG 2)**

Criteria

For adult open-angle glaucoma, evidence demonstrates at least moderate certainty of at least moderate net benefit. **(RG A1)** An unblinded randomized controlled trial of 718 patients with open-angle glaucoma or ocular hypertension compared selective laser trabeculoplasty with medical therapy as first-line treatment and found no difference in the primary outcome of health-related quality-of-life scores; selective laser trabeculoplasty was associated with more visits at target intraocular pressure compared with medical therapy (93% vs 91.3%, respectively).(19) **(EG 1)** A secondary analysis of this trial (644 patients) found that treatment with medical therapy was associated with a more rapid progression in visual field decline compared with the patients initially treated with selective laser trabeculoplasty (26.2% vs 16.9%, respectively).(20) **(EG 2)** A systematic review and meta-analysis of 8 randomized controlled trials (including the previously described randomized controlled trial) compared 1229 open-angle glaucoma patients undergoing primary treatment by selective laser trabeculoplasty vs medications alone and found no significant difference in intraocular pressure control with selective laser trabeculoplasty compared with control achieved by medications alone; however, selective laser trabeculoplasty was associated with the use of fewer medications.(21) **(EG 1)** A specialty society practice guideline states that laser trabeculoplasty is an

option for treatment of ocular hypertension.(3) **(EG 2)** A systematic review concluded that for the initial treatment of open-angle glaucoma, the clinical effectiveness of primary surgical trabeculectomy as compared with glaucoma medications is not known.(14) **(EG 1)** A systematic review of laser trabeculoplasty for the treatment of primary open-angle glaucoma concluded, based on low-certainty evidence, that patients treated with laser trabeculoplasty may have a higher risk of uncontrolled intraocular pressure at 2 years' follow-up compared with patients treated with trabeculectomy.(1) **(EG 1)**

For pediatric glaucoma, evidence demonstrates at least moderate certainty of at least moderate net benefit. **(RG A1)** Trabeculectomy (with administration of adjunctive antimetabolites such as mitomycin C) is more likely to succeed in older, phakic pediatric glaucoma patients, and success rates of 55% to 95% have been documented. However, the procedure carries long-term risks of bleb leaks and bleb-associated endophthalmitis.(28) **(EG 2)** A retrospective review of 133 pediatric eyes with glaucoma found that a filtering surgery, such as trabeculectomy, was the initial surgery in 15% of patients.(27) **(EG 2)** A retrospective comparative study of 40 eyes in 33 patients with pediatric glaucoma showed that trabeculectomy and combined trabeculotomy-trabeculectomy, both with intraoperative mitomycin C, were equally effective at lowering intraocular pressure; the combined trabeculotomy-trabeculectomy procedure was associated with greater long-term success, as 91.3% of patients sustained a successful outcome at the last follow-up examination.(29) **(EG 2)** A specialty society technical assessment notes that pediatric glaucoma is primarily treated surgically due to ineffectiveness or intolerance of medical therapy. Trabeculectomy is one surgical option; however, antimetabolites are used during trabeculectomy due to a greater risk of scarring in children. Children also experience a higher rate of endophthalmitis.(30) **(EG 2)**

References

1. Rolim-de-Moura CR, et al. Laser trabeculoplasty for open-angle glaucoma and ocular hypertension . Cochrane Database of Systematic Reviews 2022, (verified by Cochrane 2022 Aug 09), Issue 3. Art. No.: CD003919. DOI: 10.1002/14651858.CD003919.pub3. [Context Link 1, 2, 3]
2. Canadian Ophthalmological Society evidence-based clinical practice guidelines for the management of glaucoma in the adult eye. Canadian Journal of Ophthalmology 2009;44 Suppl 1:S7-S93. DOI: 10.3129/cjo44s1. [Context Link 1, 2, 3] View abstract...
3. Gedde SJ, et al. Primary Open-Angle Glaucoma Suspect. Preferred Practice Pattern [Internet] American Academy of Ophthalmology. 2020 Nov Accessed at: <https://www.aao.org/>. [accessed 2022 Sep 28] [Context Link 1, 2, 3, 4]
4. Kwon YH, Fingert JH, Kuehn MH, Alward WL. Primary open-angle glaucoma. New England Journal of Medicine 2009;360(11):1113-24. DOI: 10.1056/NEJMra0804630. [Context Link 1, 2] View abstract...
5. Boland MV, et al. Treatment for Glaucoma: Comparative Effectiveness. Comparative Effectiveness Review Number 60. AHRQ Publication No. 12-EHC038-EF [Internet] Agency for Healthcare Quality and Research Effective Health Care Program. 2012 Apr Accessed at: <https://www.effectivehealthcare.ahrq.gov/>. [accessed 2022 Mar 16] [Context Link 1, 2, 3] View abstract...
6. Toteberg-Harms M, Meier-Gibbons F. Is laser trabeculoplasty the new star in glaucoma treatment? Current Opinion in Ophthalmology 2021;32(2):141-147. DOI: 10.1097/ICU.0000000000000732. [Context Link 1, 2] View abstract...
7. Zgrzyznak A, Przezdziecka-Dolyk J, Szalinski M, Turno-Krecicka A. Selective laser trabeculoplasty in the treatment of ocular hypertension and open-angle glaucoma: clinical review. Journal of Clinical Medicine 2021;10(15):Online. DOI: 10.3390/jcm10153307. [Context Link 1] View abstract...
8. Realini T, Charlton J, Hettlinger M. The impact of anti-inflammatory therapy on intraocular pressure reduction following selective laser trabeculoplasty. Ophthalmic Surgery, Lasers and Imaging 2010;41(1):100-3. DOI: 10.3928/15428877-20091230-18. [Context Link 1] View abstract...
9. Francis BA, Winarko J. Laser trabeculoplasty in the treatment of open-angle glaucoma. International Ophthalmology Clinics 2011;51(3):165-77. DOI: 10.1097/IIO.0b013e31821e53c8. [Context Link 1, 2, 3] View abstract...
10. Samples JR, et al. Laser trabeculoplasty for open-angle glaucoma: a report by the american academy of ophthalmology. Ophthalmology 2011;118(11):2296-302. DOI: 10.1016/j.ophtha.2011.04.037. [Context Link 1, 2, 3] View abstract...
11. Landers J. Selective laser trabeculoplasty: A review. Clinical & Experimental Ophthalmology 2021;49(9):1102-1110. DOI: 10.1111/ceo.13979. [Context Link 1] View abstract...
12. Leahy KE, White AJ. Selective laser trabeculoplasty: current perspectives. Clinical Ophthalmology (Auckland, N.Z.) 2015;9:833-41. DOI: 10.2147/OPHTH.S53490. [Context Link 1] View abstract...
13. Tsang S, Cheng J, Lee JW. Developments in laser trabeculoplasty. British Journal of Ophthalmology 2016;100(1):94-7. DOI: 10.1136/bjophthalmol-2015-307515. [Context Link 1] View abstract...
14. Burr J, Azuara-Blanco A, Avenell A, Tuulonen A. Medical versus surgical interventions for open angle glaucoma. Cochrane Database of Systematic Reviews 2012, Issue 9. Art. No.: CD004399. DOI: 10.1002/14651858.CD004399.pub3. [Context Link 1, 2] View abstract...
15. Trabecular Stent Bypass Microsurgery for Open Angle Glaucoma. NICE Interventional Procedure Guidance IPG 575 [Internet] National Institute for Health and Care Excellence. 2017 Feb Accessed at: <https://www.nice.org.uk/guidance/>. [accessed 2022 Oct 24] [Context Link 1]
16. Trabeculotomy ab Interno for Open Angle Glaucoma. NICE Interventional Procedure Guidance IPG 397 [Internet] National Institute for Health and Care Excellence. 2011 May Accessed at: <https://www.nice.org.uk/guidance/>. [accessed 2022 Oct 24] [Context Link 1]
17. European Glaucoma Society Terminology and guidelines for glaucoma, 5th edition. British Journal of Ophthalmology 2021;105(Suppl 1):1-169. DOI: 10.1136/bjophthalmol-2021-egsguidelines. [Context Link 1] View abstract...
18. Glaucoma: Diagnosis and Management. NICE Guideline NG81 [Internet] National Institute for Health and Care Excellence. 2022 Jan Accessed at: <https://www.nice.org.uk/guidance/>. [created 2017; accessed 2022 Oct 22] [Context Link 1, 2]
19. Gazzard G, et al. Selective laser trabeculoplasty versus eye drops for first-line treatment of ocular hypertension and glaucoma (LiHT): a multicentre randomised controlled trial. Lancet 2019;393(10180):1505-1516. DOI: 10.1016/S0140-6736(18)32213-X. [Context Link 1] View abstract...

20. Wright DM, et al. Visual field outcomes from the multicenter, randomized controlled laser in glaucoma and ocular hypertension trial (LiGHT). *Ophthalmology* 2020;127(10):1313-1321. DOI: 10.1016/j.ophtha.2020.03.029. [Context Link 1] View abstract...
21. Chi SC, Kang YN, Hwang DK, Liu CJ. Selective laser trabeculoplasty versus medication for open-angle glaucoma: systematic review and meta-analysis of randomised clinical trials. *British Journal of Ophthalmology* 2020;104(11):1500-1507. DOI: 10.1136/bjophthalmol-2019-315613. [Context Link 1] View abstract...
22. Katz LJ, et al. Selective laser trabeculoplasty versus medical therapy as initial treatment of glaucoma: a prospective, randomized trial. *Journal of Glaucoma* 2012;21(7):460-8. DOI: 10.1097/IJG.0b013e318218287f. [Context Link 1] View abstract...
23. Rasmuson E, et al. Laser trabeculoplasty in newly diagnosed multi-treated glaucoma patients. *Acta Ophthalmologica* 2021;99(3):269-274. DOI: 10.1111/aos.14576. [Context Link 1] View abstract...
24. Brandt JD, Tompson SW, Liu Y. Congenital glaucoma. In: Yanoff M, Duker JS, editors. *Ophthalmology*. 5th ed. Elsevier; 2019:1106-1111.e1. [Context Link 1, 2]
25. Martins A, Papadopoulos M, Khaw SPT. Childhood glaucoma. In: Lyons CJ, Lambert SR, editors. *Taylor and Hoyt's Pediatric Ophthalmology and Strabismus*. 6th ed. Elsevier; 2023:407-425. [Context Link 1, 2]
26. Chang I, Caprioli J, Ou Y. Surgical management of pediatric glaucoma. *Developments in Ophthalmology* 2017;59:165-178. DOI: 10.1159/000458495. [Context Link 1] View abstract...
27. Khitri MR, Mills MD, Ying GS, Davidson SL, Quinn GE. Visual acuity outcomes in pediatric glaucomas. *Journal of AAPOS* 2012;16(4):376-81. DOI: 10.1016/j.jaapos.2012.05.007. [Context Link 1, 2] View abstract...
28. Ou Y, Caprioli J. Surgical management of pediatric glaucoma. *Developments in Ophthalmology* 2012;50:157-72. DOI: 10.1159/000334798. [Context Link 1] View abstract...
29. Lawrence SD, Netland PA. Trabeculectomy versus combined trabeculotomy-trabeculectomy in pediatric glaucoma. *Journal of Pediatric Ophthalmology and Strabismus* 2012;49(6):359-65. DOI: 10.3928/01913913-20120710-06. [Context Link 1] View abstract...
30. Chen TC, et al. Pediatric glaucoma surgery: a report by the American Academy Of Ophthalmology. *Ophthalmology* 2014;121(11):2107-15. DOI: 10.1016/j.ophtha.2014.05.010. [Context Link 1] View abstract...
31. Lusthaus J, Goldberg I. Current management of glaucoma. *Medical Journal of Australia* 2019;210(4):180-187. DOI: 10.5694/mja2.50020. [Context Link 1] View abstract...

Footnotes

[A] Glaucoma in children younger than 2 years can be subdivided into: (1) primary congenital glaucoma, which is the result of isolated abnormal development of the anterior chamber angle structures, and (2) secondary glaucomas, either following infantile cataract surgery or those associated with ocular or systemic syndromes. Glaucoma also may be diagnosed at any time during childhood and may include primary juvenile open-angle glaucoma and glaucoma secondary to acquired conditions, ocular anomalies, syndromes, or systemic diseases (eg, Axenfeld-Rieger syndrome, juvenile idiopathic arthritis, Peters anomaly, Sturge-Weber syndrome).(24)(25) [A in Context Link 1]

Codes

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Last Update: 9/21/2023 5:04:56 AM
Build Number: 27.2.2023092114759.013030