Insertion of a Baerveldt Drainage Implant with Encircling Silicone Strip Resection in a Patient with Refractory Glaucoma after Vitrectomy: A Case Report

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Abstract

Background: A glaucoma drainage implant is a useful device for the treatment of refractory glaucoma, but it is difficult to secure the space for insertion of the device. Herein we report a case of refractory glaucoma with a preexisting silicone strip that was treated using a Baerveldt Drainage Implant (BGI).

Case Presentation: A 43-year-old man developed rhegmatogenous retinal detachment. He had undergone vitrectomy twice because of retinal redetachment after the first vitrectomy. At the last vitrectomy, encircling (silicone strip #220) was performed. Immediately after the vitrectomy, the Intraocular Pressure (IOP) increased up to 30 mmHg to 50 mmHg for about 2 weeks; nevertheless, administration of hypotensive drugs and laser iridectomy. We inserted a BGI via the pars plana with silicone strip resection. The IOP reduced below 20 mmHg for 14 months after the implant surgery with the administration of hypotensive drops.

Conclusion: Insertion of a BGI via the pars plana with silicone band resection may be useful for refractory glaucoma after vitrectomy with a preexisting silicone strip.

Keywords: Retinal detachment; Encircling; Baerveldt drainage implant

Introduction

Postoperative glaucoma has been reported in 2% to 48% of patients after vitrectomy for rhegmatogenous Retinal Detachment (RD) [1-5]. The cause is considered to be pupillary block angle closure, inflammation, or a preexisting angle abnormality. Owing to conjunctival scarring and recession caused by a previous vitrectomy with an encircling band, filtration surgery is difficult to perform for maintaining a low Intraocular Pressure (IOP) to prevent postoperative glaucoma after surgery for RD.

However, it is difficult to secure the space for insertion of the plate of the device because in some cases after vitrectomy for RD, a preexisting scleral band may be present. To the best of our knowledge, there is no report on the resection of a silicone strip for the insertion of a BGI. Herein we report a case of refractory glaucoma with a preexisting silicone strip in which a Baerveldt Drainage Implant (BGI) was inserted.

Case Presentation

A 43-year-old man developed rhegmatogenous retinal detachment. Range of RD was total off. Vitrectomy combined with pars plana lensectomy using gas tamponade with silicone band (#240) was performed. However, 7 days after the first vitrectomy, retinal redetachment from the nasal inferior section was recognized. The second vitrectomy was performed with the change of silicone band (#240) to a silicone strip (#220). Immediately after the second vitrectomy, the IOP increased up to 30 mmHg to 50 mmHg for about 3 weeks because peripheral anterior synchia was observed in almost every part of the angle; nevertheless, administration of hypotensive drugs and laser iridectomy. We performed BGI via the pars plana with silicone strip resection. The IOP reduced below 20 mmHg for 14 months immediately after the implant surgery with the administration of hypotensive drops.

Results

The IOP reduced below 20 mmHg for 14 months immediately after the implant surgery with hypotensive drops.
hypotensive drops; the retina has remained attached during the follow-up period.

**Surgical Procedure**

The conjunctiva showed scarring before the operation (Figure 1.1). Sub-Tenon’s anesthesia (2% lidocaine) was administered, and a conjunctival incision was made along the corneal limbus to expose the superior and lateral rectus muscles. The silicone strip was resected at the superior nasal quadrant and the inferior temporal quadrant; the resected silicone band was removed from the superior temporal quadrant (Figure 1.2). Then, the edge of the silicone band was attached to the sclera with 5-0 polyester suture because the effect of retinal indentation to the portion of redetachment of the retina was needed to be rest (Figure 1.3 and Figure 2). A 6 mm × 6 mm fornix-based lamellar scleral flap was created, and a 25-gauge infusion line was placed in the inferotemporal quadrant.

The Baerveldt implant tube was knotted using an 8-0 polyglactin suture thread because aqueous flow through the device must be restricted until plate encapsulation and insertion beneath the lateral rectus muscles. The silicone strip was resected at the superior nasal quadrant and the inferior temporal quadrant; the resected silicone band was removed from the superotemporal quadrant (Figure 1.4). Then, the edge of the silicone band was attached to the sclera with 5-0 polyester suture because the effect of retinal indentation to the portion of redetachment of the retina was needed to be rest (Figure 1.3 and Figure 2). A 6 mm × 6 mm fornix-based lamellar scleral flap was created, and a 25-gauge infusion line was placed in the inferotemporal quadrant.

The tube of a GDD is usually inserted into the Anterior Chamber (AC), but complications, including a shallow anterior chamber and corneal endothelial decompensation, have been reported following insertion of a GDD tube into the anterior chamber [7-10]. The pars plana GDD is designed to avoid these complications [11], but requires thorough resection of the vitreous by vitrectomy to avoid occlusion of the tube by the vitreous. Therefore, if the patient has already undergone a vitrectomy for RD, pars plana GDD is considered a good device for refractory glaucoma after vitrectomy.

Smith et al. [12] reported the use of a long-valved (plateless) Krupin-Denver tube inserted into the encapsulated band in cases with a preexisting silicone band. However, distal tube occlusion was recognized in 30% of these cases. Sidoti et al. [13] reported that the success rate of BGI is 85% in eyes with a preexisting scleral band without resection of the silicone band. This study reported that obstruction of the distal tube opening by episcleral fibrous tissue was a frequent complication.

Sufficient posterior dissection between the sclera and tenon capsule in the quadrant of implantation is necessary to allow adequate seating of the implant and resection of the silicone band is required to secure a space for insertion of the plate. The GGD used
in this case was a pars plana BGI that has a plate measuring 350 mm [2]. In this case, a silicone strip #220 (width 6 mm) was previously used, because of which it was difficult to secure a space for insertion of the plate of the BGI. Further, the BGI was inserted with resection of the preexisting silicone band, rather than removing the entire band, because soon after the vitrectomy, the effect of indentation of scleral band to the retinal detachment position wanted to be rest. The rest of silicone strip was sutured to the eye ball at the edge of the silicone band. Therefore, we inserted the BGI on the opposite side where the retina showed reattachment.

If the silicone band is wide and is not resected, the silicone tube from the plate may be occluded by the compression of silicone band. However, the silicone tube was not placed under the band owing to the possibility that the band-scleral compression would perforate the sclera at the tube site. Sidoti et al. [14] reported a case of Baerveldt implantation complicated by scleral perforation at the site of severe ectasia underlying a previously placed scleral buckle.

Regarding the space for insertion of the plate, the superonasal quadrant should be avoided for larger GDDs because the implant or an overlying bleb may interfere with the function of the superior oblique muscle, resulting in acquired Brown’s syndrome [15,16].

Our findings in the current case suggest that insertion of a BGI via the pars plana with resection of the silicone band may be useful for refractory glaucoma in eyes after vitrectomy with a preexisting silicone strip.

**Statements**

**Acknowledgement**

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**Statement of ethics**

The report was approved by the ethics committee at Toho University Sakura Medical Center (approval number S16047). All study conduct adhered to the tenets of the Declaration of Helsinki.

**Author contributions**

Masashi Sakamoto, Keisuke Yata, Izumi Yoshida and Asao Sakai participated in data management, analysis, and interpretation; Masashi Sakamoto, Izumi Yoshida, Asao Sakai and Takatoshi Maeno prepared, reviewed, and approved the manuscript.

**References**


