

# Vitreous prolapse through the scleral wound in 25-gauge transconjunctival vitrectomy

H. SHIMADA, H. NAKASHIZUKA, T. HATTORI, R. MORI, Y. MIZUTANI, M. YUZAWA

Department of Ophthalmology, School of Medicine, Nihon University, Tokyo - Japan

**PURPOSE.** *To examine the effectiveness of excising peripheral vitreous until the cannula tip is exposed to prevent vitreous prolapse through the scleral wound in 25-gauge transconjunctival vitrectomy.*

**METHODS.** *Twenty-five-gauge vitrectomy was performed in 60 consecutive eyes. Peripheral vitrectomy was conducted until the cannula tip was exposed in 30 eyes and with conservation of the vitreous around the cannula in 30 eyes. Vitreous prolapse through the scleral wound was examined using a suction stick.*

**RESULTS.** *Vitreous prolapse through the scleral wound was transparent, fine and short, and detectable only with the suction stick. The incidence of vitreous prolapse through the scleral wound was 0% (0 of 30 eyes) when peripheral vitreous was excised until the cannula tip was exposed, and 20% (6 of 30 eyes) when the vitreous around the cannula was conserved, with a significant difference between two groups ( $p=0.0237$ ). In two of six eyes with vitreous prolapse, the scleral wound was open, but there was no leakage of intraocular fluid and normal ocular pressure was maintained.*

**CONCLUSIONS.** *If peripheral vitrectomy is performed without excising the vitreous surrounding the cannula, there is a 20% risk of the vitreous prolapsing through the scleral wound. Vitreous prolapse through the scleral wound is difficult to detect because it is transparent, fine and short, and there is no intraocular fluid leakage. Therefore, detecting vitreous prolapse with a suction stick and appropriate intervention are important for preventing endophthalmitis. (Eur J Ophthalmol 2008; 18: 659-662)*

**KEY WORDS.** *Twenty-five-gauge transconjunctival vitrectomy, Endophthalmitis, Peripheral vitrectomy, Vitreous prolapse, Vitreous incarceration*

Accepted: January 30, 2008

## INTRODUCTION

The 25-gauge (G) transconjunctival vitrectomy has been expanded to diseases that require peripheral vitrectomy, such as retinal detachment and proliferative diabetic retinopathy (1, 2). However, a recent study showed 25-G vitrectomy to be associated with a significantly higher, i.e., a 12-fold increased incidence of endophthalmitis as compared with 20-gauge vitrectomy (3). We have noted that the peripheral vitreous tends to be incarcerated in the cannula during 25-G vitrectomy, and when the cannula is extracted under

these conditions, prolapse of the vitreous through the scleral wound is common. Since prolapse of the transparent vitreous is difficult to detect and carries a risk of endophthalmitis development if left untreated, we investigated the prevention of vitreous prolapse in 25-G vitrectomy.

## METHODS

We studied 60 eyes of 60 consecutive patients (33 male and 27 female, aged from 37 to 82 years, mean

65.3±9.5 years) undergoing 25-G sclera tunnel transconjunctival vitrectomy for the first time (4). Cataract surgery was conducted simultaneously in 41 eyes (68%). Peripheral vitrectomy to the extent of exposing cannula tip (30 eyes) was conducted in October 2007, while peripheral vitrectomy with conservation of the vitreous around the cannula (30 eyes) was done in November 2007. These two groups were compared (Tab. I). Vitrectomy was performed with the Accurus 800 CS (Alcon Surgical, Fort Worth, TX, USA) using a 25-gauge high speed cutter (2500 cuts/minute; Medical Instrument Development Laboratories, San Leandro, CA, USA). In vitrectomy, the conjunctiva is slightly displaced with forceps. At a site 4.0 mm from and parallel to the limbus, a trocar is inserted with the bevel facing downward at a 30-degree angle, creating a tunnel sclerotomy. In peripheral vitrectomy with cannula tip exposure, the vitreous was excised while the cannula was pressed using forceps. Thirty percent fluid-air exchange was done in 29 eyes for closure of the scleral wound; full fluid-air exchange in 20 eyes with proliferative diabetic retinopathy for closure of the scleral wound and achieving hemostasis; and gas exchange in 11 eyes for retinal detachment and macular hole treatment. At completion of the vit-

rectomy, no intraocular fluid leakage was found. A suction stick was used to examine for vitreous prolapse through the scleral wound at three ports.

## RESULTS

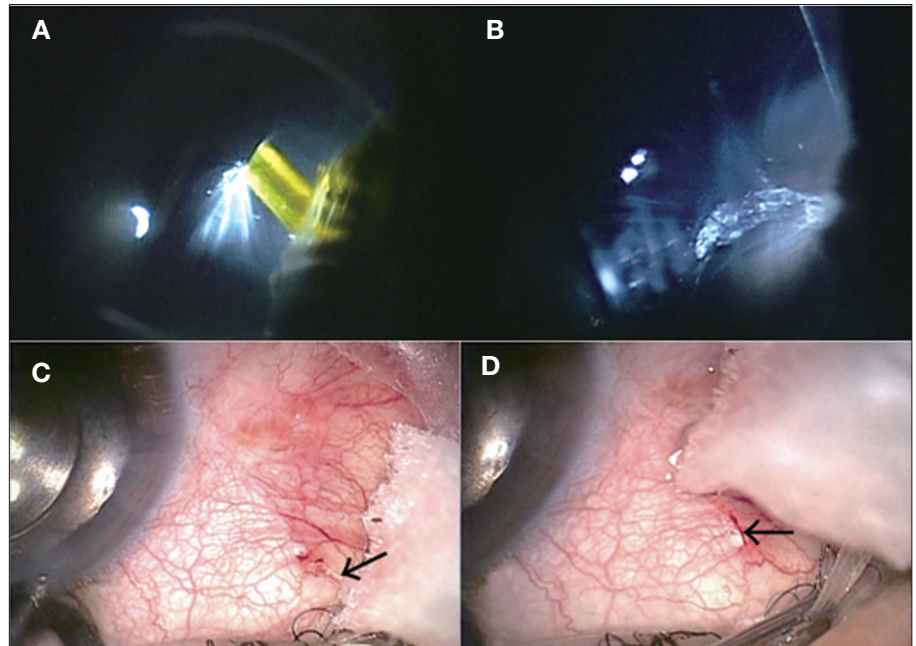
The incidence of vitreous prolapse through the scleral wound was 0% (0 of 30 eyes) when the vitreous was removed until the cannula tip was exposed, and 20% (6 of 30 eyes) when the vitreous around the cannula was conserved, with a significant difference between the two groups (Fisher exact probability test,  $p=0.0237$ ). Vitreous prolapse occurred at the infusion port, the right port, and the left port in 0, 4, and 2 eyes, respectively (chi-squared test for independent variable,  $p=0.0273$ ). In two of six eyes with vitreous prolapse, the scleral wound was open, but since the vitreous blocked this wound, there was no leakage of intraocular fluid and normal ocular pressure was preserved (Fig. 1). The prolapsed vitreous was excised with a 25-G cutter, and the open scleral wound was again compressed to close the wound and then covered with the conjunctiva. None of our cases showed postoperative leakage of intraocular fluid or an in-

**TABLE I - SURGICAL PROCEDURES AND STATUS OF VITREOUS PROLAPSE THROUGH THE SCLERAL WOUND IN 60 STUDIED EYES**

| Extent of peripheral vitrectomy (no. of eyes)       | Incidence of vitreous prolapse through scleral wound (%) | Site of vitreous prolapse                                  | Nonclosure of scleral wound (%) | Disease (no. of eyes)                                                                                                                                                                 |
|-----------------------------------------------------|----------------------------------------------------------|------------------------------------------------------------|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Vitreous excised until cannula tip was exposed (30) | 0/30 (0)*                                                | Infusion port: 0<br>Left port: 0<br>Right port: 0          | 0/30 (0)†                       | Proliferative diabetic retinopathy (11)<br>Epiretinal membrane (7)<br>Diabetic macular edema (5)<br>Macular hole (4)<br>Retinal detachment (2)<br>Vitreoretinal traction syndrome (1) |
| Vitreous around cannula is conserved (39)           | 6/30 (20)*                                               | Infusion port: 0/6‡<br>Left port: 1/6‡<br>Right port: 5/6‡ | 2/30 (7)†                       | Proliferative diabetic retinopathy (9)<br>Epiretinal membrane (7)<br>Diabetic macular edema (6)<br>Macular hole (5)<br>Retinal vein occlusion (2)<br>Vitreous opacity (1)             |

Fisher exact probability test: \* $p=0.0237$ , † $p=0.4915$ . Chi-squared test for independent variable: ‡ $p=0.0273$

**Fig. 1** - A case in which peripheral vitrectomy was conducted sparing the vitreous around the cannula. **(A)** Intraocular fluid leakage during surgery; the vitreous around the cannula is incarcerated in the cannula. **(B)** When the cannula is extracted along with the vitreous incarcerated in the cannula, the vitreous becomes incarcerated in the scleral wound. **(C)** Transparent vitreous prolapsed through the scleral wound is detected by the suction stick (arrow). **(D)** The prolapsed vitreous is connected to the open scleral wound (arrow). Since the wound was closed by the vitreous, there was no leakage of intraocular fluid and normal intraocular pressure was maintained despite the open scleral wound.



traocular pressure lower than 10 mmHg, and no postoperative endophthalmitis was observed.

## DISCUSSION

At the completion of surgery, the left cannula is extracted first, followed by the right. Vitreous prolapse was more common on the right, probably because this port is subjected to greater infusion pressure. There was no vitreous prolapse at the infusion port, because an infusion guide is placed inside the cannula, which is then extracted under infused conditions. When the vitreous is incarcerated in the scleral wound, it protrudes into the subconjunctival space and may even prolapse out of the conjunctiva in some cases. Adequately displacing the conjunctiva during surgery may limit vitreous prolapse into the subconjunctival space. However, to prevent this prolapse, it is necessary to excise peripheral vitrectomy until the cannula tip is exposed. When this level of peripheral vitrectomy is difficult, such as in phakic eyes, special attention is needed to check for prolapse of the vitreous.

Reported cases of endophthalmitis after 25-G vitrectomy include four eyes with vitreous hemorrhage (3), four with epiretinal membrane (3, 5), one with mild vitreous opacity (6), and one with vitreomacular traction

syndrome (7). All these diseases can be treated even when peripheral vitreous remains. In all 10 eyes, there was no hypotony on postoperative day 1. When the peripheral vitreous is conserved, the vitreous is incarcerated in the wound when the cannulae are extracted, thereby preventing leakage of intraocular fluid and postoperative hypotony.

Vitreous prolapse through the scleral wound is difficult to detect since it is transparent, fine, and short, and intraocular fluid leakage is absent. It is necessary to observe the wounds carefully using a suction stick; if prolapse is detected, excise with a 25-G cutter, followed by compression to close the scleral wound, and then cover the wound with the conjunctiva.

*None of the authors has proprietary interests.*

Reprint requests to:  
 Prof. Hiroyuki Shimada, MD, PhD  
 Department of Ophthalmology  
 Surugadai Hospital of Nihon University  
 1-8-13 Surugadai, Kanda, Chiyodaku  
 Tokyo 101-8309, Japan  
 sshimada@olive.ocn.ne.jp

## REFERENCES

1. Ibarra MS, Hermel M, Prenner JL, et al. Long-term outcome of transconjunctival sutureless 25-gauge vitrectomy. *Am J Ophthalmol* 2005; 139: 831-6.
2. Shimada H, Nakashizuka H, Mori R, Mizutani Y. Expanded indications for 25-gauge transconjunctival vitrectomy. *Jpn J Ophthalmol* 2005; 49: 397-401.
3. Kunimoto DY, Kaiser RS. Incidence of endophthalmitis after 20- and 25-gauge vitrectomy. *Ophthalmology* 2007; 114: 2133-7.
4. Shimada H, Nakashizuka H, Mori R, et al. 25-gauge scleral tunnel transconjunctival vitrectomy. *Am J Ophthalmol* 2006; 142: 871-3.
5. Acar N, Unver YB, Altan T, Kapran Z. Acute endophthalmitis after 25-gauge sutureless vitrectomy. *Int Ophthalmol* 2007; 27: 361-3.
6. Taylor SR, Aylward GW. Endophthalmitis following 25-gauge vitrectomy. *Eye* 2005; 19: 1228-9.
7. Taban M, Ufret-Vincentry RL, Sears JE. Endophthalmitis after 25-gauge transconjunctival sutureless vitrectomy. *Retina* 2006; 26: 830-1.

Copyright of European Journal of Ophthalmology is the property of Wichtig Editore and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.