Outcomes of Combined 25 Gauge and 20 Gauge Pars Plana Vitrectomy*

Kombine 25 Gauge ve 20 Gauge Pars Plana Vitrektomi Tekniğinin Sonuçları

Nur ACAR[1], Ziya KAPRAN[2], Tuğrul ALTAN[1], Yaprak Banu ÜNVER[1], Serap YURTTAŞER[3]

Klinik Çalışma *Original Article*

ABSTRACT

Purpose: To evaluate the anatomical and functional outcomes of combined 25 gauge and 20 gauge pars plana vitrectomy (PPV) in the treatment of a variety of vitreoretinal diseases.

Materials and Methods: In this retrospective interventional case series combined 25 gauge and 20 gauge PPV was performed in 41 eyes. In the combined technique, two 25 g sutureless sclerotomies and one 20 g (for the active hand) sclerotomy were performed. Eyes with a minimum follow-up of 6 months were evaluated. Main outcome measures were the number of sutures in 25 gauge sclerotomies, changes in visual acuity, intraocular pressure (IOP), and rates of complications.

Results: Mean follow-up was 9.34±2.27 months. No suture was necessary for the 25g sclerotomies. Mean visual acuity improved at postoperative month 1 ($p=0.002$) and at the last visit ($p<0.001$). A significant decrease in mean IOP was detected after 2 hours ($p<0.001$) and by day 1 ($p=0.001$) postoperatively. In one (2.43%) eye transient severe hypotony was observed. In two eyes operated on with a diagnosis of a macular hole, the holes were sealed after a second surgical procedure.

Conclusion: Combined 25 g and 20 g PPV for treatment of a variety of vitreoretinal diseases yielded anatomic and functional recovery without significant complications. This technique combines the advantages of both systems, expands the indications of 25 g sutureless vitrectomy, and obviates the need for a variety of 25 g instruments.

Key Words: 20 gauge pars plana vitrectomy, 25 gauge pars plana vitrectomy, sutureless vitrectomy, transconjunctival sutureless vitrectomy.

ÖZ

Amaç: Çeşitli vitreoretinal hastalıkların tedavisinde kombine 25 gauge (25 g) ve 20 gauge (20 g) pars plana vitrektomi (PPV) tekniğinin anatomik ve fonksiyonel sonuçlarını incelemek

Gereç ve Yöntemler: Bu retrospektif girişimsel olgu serisinde, 41 gözde kombine 25 gauge ve 20 gauge PPV uygulandı. Bu kombine teknikte, iki adet 25 gauge sütürsüz ve bir adet 20 gauge (aktif el için) sklerotomi yapıldı. En az 6 ay takip edilen gözler incelendi. Başlıca incelenen parametreler 25 gauge sklerotomilerde kullanılan sütür sayısı, görme keskinliğindeki (GK), göz içi basıncındaki (GİB) değişiklikler ve komplikasyon oranları idi.

Bulgular: Ortalama takip süresi 9.34±2.27 aydı. 25 gauge sklerotomilerin hiçbirinde sütüre gerek duyulmadı. Ortalama görme keskinliği postoperatif 1. ayda ($p=0.002$) ve en son kontrolde ($p<0.001$) anlamlı olarak arttı. Ortalama GİB'de postoperatif 2. saatte ($p<0.001$) ve 1. günde ($p=0.001$) anlamlı azalma saptandı. Bir (%2.43) gözde geçici ciddi hipotoni görüldü. Maküla deliği tanısıyla opere edilen iki gözde delikler ikinci bir cerrahi girişim sonrasında kapandı.

Sonuç: Kombine 25 gauge ve 20 gauge pars plana vitrektomi tekniği, çeşitli vitreoretinal hastalıkların tedavisinde ciddi komplikasyonlara yol açmadan anatomik ve fonksiyonel iyileşme sağlamıştır. Bu teknik, her iki sistemin avantajlarını birleştirmekte, 25 gauge sütürsüz vitrektominin endikasyonlarını genişletmekte ve çok çeşitli 25 gauge aletleri bulundurma gereksinimini önlemektedir.

Anahtar Kelimeler: 20 gauge pars plana vitrektomi, 25 gauge pars plana vitrektomi, sütürsüz vitrektomi, transconjunctival sutureless vitrectomy.

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1- Beyoğlu Göz Egitim ve Araştırma Hastanesi, II.Göz Klinigi, İstanbul, Uzm. Dr.
2- Beyoğlu Göz Egitim ve Araştırma Hastanesi, II.Göz Klinigi, İstanbul, Doç. Dr.
3- Beyoğlu Göz Egitim ve Araştırma Hastanesi, II.Göz Klinigi, İstanbul, Asist. Dr.

1- M.D. Beyoglu Eye Education and Research Hospital, İstanbul / TURKEY
ACAR N., nuracar@yahoo.com
ALTAN T., tugrulaltan@gmail.com
ÜNVER Y.B., yaprakbanu@yahoo.com
2- M.D. Associate Proffessor, Beyoglu Eye Education and Research Hospital, İstanbul / TURKEY
KAPRAN Z., zkapran@hotmail.com
3- Beyoglu Eye Education and Research Hospital, İstanbul / TURKEY
YURTTASER S.,
Correspondence: M.D. Nur ACAR
Beyoglu Eye Education and Research Hospital, İstanbul / TURKEY

INTRODUCTION

The 25 gauge (25 g) transconjunctival sutureless vitrectomy system, first described by Fujii and coworkers in 2002[1], offers sutureless three-port vitrectomy without the need for conjunctival peritomies or suturing when compared with conventional 20 gauge (20 g) pars plana vitrectomy (PPV). Twenty-five gauge sutureless vitrectomy has become increasingly popular in selected patients as it decreases surgical trauma, postoperative inflammation, and patient discomfort.[2-14] Success has been reported using 25 g sutureless vitrectomy in eyes with various vitreoretinal disorders.[2-16] In eyes with macular pucker, and macular hole visual recovery occurs earlier with 25 g sutureless vitrectomy compared to 20 g vitrectomy.[7,9,10] However, there are some limitations of 25 g sutureless vitrectomy. It is still not preferred in complex retinal detachments with severe proliferative vitreoretinopathy (PVR).[2-8,14,15] Foreign bodies are usually larger than the 25 g sclerotomy port. Phacofragmentation is not possible with 25 g equipment; and the need for additional 25 g instruments increases the cost per procedure. Furthermore, the transition to smaller gauge sutureless surgery requires a period of adaptation to small, more flexible instruments. Modifications in technique, however, are addressing some of these issues. Charles S,[17] and Shimada et al,[12] reported combining two 25 g sutureless with one 20 g sutured incision to overcome some of the difficulties of 25 g vitrectomy.

In this study, we evaluated the anatomical and functional outcomes of combined 25 g and 20 g vitrectomy in the surgical treatment of a variety of vitreoretinal diseases.

MATERIALS AND METHODS

In this retrospective case series we evaluated the anatomical and functional outcomes of a series of 41 eyes from 41 patients who underwent combined 25 g and 20 g vitrectomy at our hospital between March 2004 and March 2006. The surgeries were performed by first four authors who are experienced vitreoretinal surgeons. The possible risks and benefits of the treatment were explained to the patients and informed consent was obtained in accordance with the Helsinki Declaration prior to the procedures.

Surgical indications for this selected series were idiopathic epiretinal membrane (ERM), macular hole (MH), central retinal vein occlusion (CRVO), diabetic traction retinal detachment (DTRD), posttraumatic lens drop, vitreomacular traction (VMT), intraocular foreign body (IOFB), and subretinal hemorrhage secondary to age-related macular degeneration (AMD). We excluded patients under 16 years of age. Information regarding age, gender, preoperative and postoperative best corrected visual acuity (BCVA), intraocular pressure (IOP), biomicroscopic and fundoscopic findings, number of sutures at the 25 g sclerotomy sites, complaints of foreign body sensation postoperatively, and surgical complications was collected from the medical records. Visual acuity was measured using the ETDRS chart and converted to logarithms of the minimum angle of resolution (logMAR) score for analysis. Intraocular pressure (IOP) was measured with Goldmann applanation tonometry. Hypotony was defined as IOP less than 8 mmHg,[3,18] and severe hypotony was defined as IOP less than or equal to 5 mmHg.[19] We monitored intraoperative and postoperative complications including incidence of retinal detachment, vitreous or suprachoroidal hemorrhage, choroidal detachment/folds, and endophthalmitis. Main outcome measures were the number of sutures in 25 g sclerotomies, changes in VA and IOP, along with intraoperative and postoperative complications.

Surgical Technique

A sub-Tenon's injection was given for local anesthesia. We displaced the conjunctiva immediately above the intended sclerotomy site with the help of a cotton swab or forceps. Then the beveled trocar with the microcannula was inserted perpendicularly into the midvitreous through the conjunctiva and sclera, using standard incisions as described by Fujii et al.[1] A 25 g infusion cannula was placed in the inferotemporal quadrant and infusion was initiated. The second 25 g microcannula was placed in the superotemporal or superonasal site, depending on the side of the eye relative to the surgeon's nondominant hand. The third sclerotomy was used for the main surgical maneuvers that would be performed by the dominant hand of the surgeon. The 3rd sclerotomy was directly prepared as 20 g. For its preparation, the overlying conjunctiva in the quadrant of the intended 20 g sclerotomy area was dissected with a scissor and then the sclera was cauterized to prevent bleeding from scleral vessels. Then 20 g sclerotomy was performed with a 20 g microvitreoretinal blade inserted vertically into the midvitreus. The noncontact wide-angle viewing system (SDI/BIOM 3TM, Oculus Inc, Germany) was used for visualization of the fundus. Vitrectomy was performed with Accurus 800 CS (Alcon Surgical, Forth Worth, TX, USA) with a 25 g transconjunctival sutureless vitrectomy system (either Alcon Surgical, or Bausch and Lomb, St Louis, MO, USA).

All eyes underwent vitrectomy followed by elevation and removal of the posterior hyaloid membrane with the 25 g cutter. A cutting rate of 1500 cuts per minute and a linear vacuum with a maximum level of 500 mmHg were used during PPV. The bottle height of the infusion fluid was set at 60 cm. Vitrectomy, endoilluminator, endodiathermy, and endolaser probes used during surgery were all 25 g. Serrated forceps, internal limiting membrane (ILM) forceps, vertical and horizontal scissors, silicone-tipped aspiration cannula, radial optic neurotomy (RON) blade, subretinal cannula, foreign body forceps, and the phacofragmentation probe used for certain tasks during surgery were all 20 g. In all eyes with MH, ILM peeling

was performed using intravitreal injection of diluted (x5 with balanced salt solution, 0.8 mg/0.1cc) triamcinolone acetonide (Kenacort-A®, Bristol-Myers-Squibb, Peapack, NJ, USA). For eyes with DTRD, release of any epiretinal or tractional forces on the retina was performed, followed by panretinal photocoagulation with 25 g endolaser. The eye with submacular hemorrhage secondary to AMD underwent subretinal tissue plasminogen activator injection and partial fluid-air exchange. Eyes with CRVO underwent single RON at the nasal site. In eyes with lens drop, the height of the infusion line was increased to 80 cm to keep IOP at a normal level during phacofragmentation. In an eye with IOFB, the 20 g incision was enlarged to 3.5 mm; the height of the infusion was also increased to 80 cm transiently, and after removal of the IOFB the enlarged sclerotomy was sutured to decrease its size to 20 g. When fluid-gas exchange was performed, either sulfur hexafluoride (SF6, 20%), perfluoropropane (C^3F^8, 15%), or sterile air was used. In an eye with co-existing cataract, phacoemulsification through a clear corneal incision with foldable acrylic posterior chamber intraocular lens implantation into the capsular bag was performed before initiating combined PPV technique. At the end of the surgical procedure, the single 20 g sclerotomy and overlying conjunctiva were sutured seperately with 7-0 vicryl (Ethicon, Cornelia, Georgia, USA). Before removal of each 25 g microcannula, the infusion line was temporarily closed. After removal, moderate pressure was applied to the entry site with a cotton swab and the overlying conjunctiva was displaced slightly. The infusion line was re-opened to make the eye normotonous, and then the infusion line was closed again and the microcannula was removed. We examined the entry sites for bleb formation from fluid or gas and for leakage. Intravitreal injection of air with a 30 g needle was planned if hypotony was noted. We injected subconjunctival antibiotic (cefazolin) and steroids at the end of the surgery.

We measured IOP in all patients two hours after surgery. Postoperatively, we performed complete ocular examinations on the first day, at the end of the first week, first month, and bimonthly thereafter unless a complication occurred. Patients were asked to evaluate their foreign body sensation at the three sclerotomy sites on a scale of 0 to 3 (0= none; 1= mild, 2= medium, and 3= severe). These assessments were made on day 1 and at one week postoperatively, and the results were recorded.

Statistical analysis was performed with software (SPSS 11.5 for Windows**,** Microsoft). Preoperative and postoperative BCVA and IOP levels were compared with a paired t-test. A p value of less than 0.05 was considered statistically significant.

Table: Surgical indications, preoperative and postoperative visual acuities of eyes that underwent combined 25 g and 20 g pars plana vitrectomy. 20 g active instrument used, and complications are also noted.

Indications for surgery	**20 gauge instrument for the active hand**	**n (%)**	**Preoperative VA* (logMAR)**	**Postoperative VA* (logMAR)**	**P†**	**Complications**
Epiretinal membrane	Serrated forceps, ILM forceps	18 (43.90)	20/125 (0.79±0.69)	20/50 (0.41±0.39)	0.003	
Macular hole	ILM forceps	10 (24.39)	20/160 (0.90±0.39)	20/63 (0.57±0.45)	<0.001	Revitrectomy with air/gas exchange, n:2
CRVO	RON blade	4 (9.75)	20/800 (1.62±0.51)	20/640 (1.55±0.54)	0.88	
DTRD	Horizontal curved, vertical scissors	3 (7.31)	CF (2.33±0.57)	20/800 (1.76±1.15)	‡	
VMT	ILM forceps	2 (4.87)	20/500 (1.40±0.84)	20/100 (0.75±0.77)	‡	
Posttaumatic lens drop	phacofragmatome	2 (4.87)	20/60 (0.45±0.07)	20/32 (0.25±0.21)	‡	Transient hypotony
Subretinal hemorrhage-AMD	Subretinal cannula	1 (2.43)	20/80 (0.60)	20/80 (0.60)	‡	
IOFB	IOFB forceps	1 (2.43)	20/100 (0.70)	20/25 (0.10)	‡	

ILM: Internal Limiting Membrane, CRVO: Central Retinal Vein Occlusion, RON: Radial Optic Neurotomy, DRTD: Diabetic Traction Retinal Detachment, VMT: Vitreomacular Traction, AMD: Age Related Macular Degeneration, IOFB: Intraocular Foreign Body, N: Number of eyes, VA: Visual Acuity, *: Mean values if n >1,; SD: Standard Deviation, CF: Counting Fingers, †: Paired samples t-test, ‡: Statistical analysis was not performed because of small number of patients.

RESULTS

The mean age of 26 male and 15 female patients was 62.68±11.37 (standard deviation) years. The distribution of the surgical indications is indicated in the table. Twenty-seven (65.85%) eyes were phakic, 11 (26.82%) eyes were pseudophakic with an intact posterior capsule, and 3 (7.31%) eyes were aphakic. The surgery was successfully completed with combined 25 g and 20 g PPV technique in all eyes without intraoperative complications. No suture was placed in any of the 25 g sclerotomies. Air and gas tamponades were used in 4 (9.75%), and 18 (43.90%) eyes respectively, whereas 19 (46.34%) eyes were left with fluid. No localized bleb formation occurred in any of the eyes. Additional air injection was performed in 1 (2.43%) eye in the operating room due to hypotony. Only 1 (2.43%) eye also underwent cataract surgery. The patients were followed for a mean period of 9.34±2.27 (range: 8-17) months.

The median preoperative BCVA was 20/100 and the median postoperative BCVA was 20/40. Mean preoperative BCVA was logMAR, 1.01±0.71, and mean postoperative BCVA on the first day, the first week, after the first month, and at the final visit was logMAR, 1.35±0.76 *(p: 0.004)*; 1.34±0.77 *(p: 0.005)*; 0.78±0.67 *(p: 0.002)*; 0.66±0.65 *(p<0.001),* respectively. There was a significant decrease in mean BCVA on the first day and at the first week. A statistically significant increase in mean BCVA was detected at the first month and at the last visit compared to the preoperative mean BCVA. Preoperative and postoperative mean BCVA for all groups of eyes, according to their surgical indications, are listed in the table.

Mean preoperative IOP was 15.85±3.37 mmHg, and mean postoperative IOPs at 2 hours, on the first day, at the first week, at the first month, and at the final visit were 8.76±3.28 (*p<0.001*), 12.40±4.61 (*p=0.001*), 15.02±4.13 (*p=0.597*), 15.80±3.54 (*p=0.574*), and 15.66±2.20 (*p=0.693*), respectively. A statistically significant decrease in mean postoperative IOP compared to the mean preoperative IOP was found at 2 hours and on day 1. No statistically significant change between pre- and postoperative IOP levels was detected at other controls. At 2 hours postoperatively, hypotony was observed in 5 (12.19%) eyes. Four (9.75%) eyes that underwent PPV for posttraumatic lens drop (n:1), ERM (n:2), and MH (n:1) demonstrated severe hypotony. In 4 of these 5 eyes, IOP increased to normal on the first postoperative day without additional procedures. In one (2.43%) eye that underwent PPV due to lens drop, IOP increased to normal in 4 days without any sequela. Neither choroidal detachment nor folds were seen during follow-up.

On day 1 and at week 1, all patients complained of foreign body sensation in the quadrant of the eye where the 20 g sclerotomy was sutured. The mean grade was 2±0.54 on postoperative day 1, and 1.09±0.30 after one week. No patients complained of foreign body sensation at the 25 g sclerotomy sites. No postoperative inflammation was detected after the first month. During the follow-up period, 3 (11.11%) of 27 phakic patients exhibited a significant increase in cataracts, and underwent cataract extraction and IOL implantation.

In 2 eyes with stage 3 MHs that underwent ILM peeling and air/ SF6 gas exchange, MHs were observed to remain open during follow-up. Postoperative IOPs were normal with appropriate gas fill. However, it was noted that these two patients were noncompliant for the postoperative prone positioning. Combined 25 g and 20 g revitrectomy with C^3F^8 gas exchange was performed. During revitrectomy no residual ILM around the MHs was demonstrated. At the last postoperative visit, MHs in all eyes were closed, as observed using contact lens fundoscopy and optical coherence tomography (OCT) (Stratus OCT TM, Carl Zeiss Ophthalmic System Inc, Dublin, USA). No vitreous hemorrhage, retinal detachment or endophthalmitis was observed during follow-up.

DISCUSSION

Twenty-five gauge sutureless vitrectomy offers advantages including decreased surgical trauma, postoperative inflammation, patient discomfort, postoperative astigmatism, and hastened visual recovery.[2-16,20,21] The technique also has limitations such as unavailability of appropriate equipment, the need for experience to acquire proficiency with the smaller and more flexible instruments, and the higher cost compared to 20 g technique. However, these can be overcome by combining two 25 g sutureless sclerotomies with one 20 g standard incision for performing the main task during vitrectomy. This combined technique has been described by Charles S[17], and Shimada et al.[12] Charles S,[17] used this technique for dislocated lens materials, foreign body removal, and silicone oil injection. Shimada et al,[12] reported the results of their 25 g vitrectomy series and pointed out that they needed to perform one additional 20 g sclerotomy in 12 of 169 eyes in order to expand the indications for 25 g vitrectomy. However, they modified their technique slightly in that after they performed vitrectomy with a 25 g cutter, they plugged one 25 g microcannula. Then they made an additional opening through the conjunctiva and sclera together using a 20 g microvitreoretinal blade close to the plugged 25 g entry site. Through this fourth incision they were able to use 20 g subretinal forceps, subretinal spatula, illuminated laser probe, and a silicone injection needle as needed to perform specific tasks in those 12 eyes.[12]

A thorough review of the literature reveals that ours is the first study evaluating the outcomes of combined 20 g and 25 g vitrectomy technique. Our study population consisted of two categories of patients. The first included eyes in which certain tasks could not be done with 25 g

equipment but could be performed by opening only one 20 g sclerotomy while maintaining the advantages of sutureless vitrectomy with the help of two 25 g sclerotomies. Foreign body forceps, phacofragmatome, and angled subretinal cannula were 20 g instruments needed to perform certain tasks. The second category consisted of eyes in which surgery could be performed with 25 g instruments, but opening one 20 g incision provided the surgeon with an additional option if he did not have the necessary 25 g instrument at hand. Serrated forceps and ILM forceps of 20 g size were used in these eyes. Consequently, this consecutive series of eyes represents the transition of our surgical technique from 20 g to 25 g sutureless vitrectomy. We believe that a combined technique may provide a good alternative in cases where the surgeon feels the need for the familiarity of the conventional 20 g technique for a particular surgical maneuver as well as the benefits of the more flexible 25 g instruments.

In our series, unlike Shimada et al,[12] we opened one 20 g sclerotomy at the beginning of the surgery, so PPV was accomplished with three sclerotomies rather than four compared to their series. One potential problem in combining a 25 g infusion line with one 20 g sclerotomy was maintaining stable intraoperative IOP. As the infusion cannula is of 25 g size, using a 20 g vitrectomy probe can cause intraoperative hypotony unless the height of the infusion bottle or the infusion pressure is increased accordingly. To prevent intraoperative hypotony, we performed vitrectomy with a 25 g probe through a 20 g sclerotomy. Since the incision was not enlarged with the insertion of a probe with a smaller diameter, we experienced no intraoperative complication such as clinically significant leakage from 20 g sclerotomy causing intraoperative hypotony. If the infusion pressure was insufficient during active cutting and aspiration, we increased the height of the infusion bottle temporarily to achieve normal IOP. We decreased the infusion to the usual level before removing the instruments to prevent any retinal or vitreous incarceration. Having successfully maintained IOP at the appropriate level, we did not experience any intraoperative complications.

In our study we did not need to suture any 25 g sclerotomies, and suture placement was not necessary in most of the reports in the literature[2,3,7,13,16], although some authors noted suturing 25 g sclerotomies in 3.6-8% of eyes with standard incisions.[4,11,14] In these eyes, however, extensive intraocular manipulation had been performed, likely resulting in wound extension. In our study, no wound extension was observed in 25 g sclerotomies as they were used only for the infusion and endoillumination. In only one eye, air injection was performed in the operating room due to low tactile pressure of the eye. However, we did not observe postoperative leakage in the remaining eyes. In the early postoperative period at 2 hours, 12% of eyes had hypotony, and 10% had severe hypotony, which is compatible with the literature.[18] The 2.4% of hypotony observed on postoperative day 1 is in the historical range, which has been reported to vary between zero[3] and 30%.[5] In all eyes with hypotony IOP increased to normal levels without any sequela. In our study we found a statistically significant decrease in mean IOP levels postoperatively at 2 hours and on day 1, which tended to increase afterwards, reaching normal levels by the first week, consistent with wound healing. This finding is similar to previous studies.[3,6,11,18] In this series, we did not encounter any postoperative complications such as retinal detachment, vitreous hemorrhage, choroidal detachment/ folds, or endophthalmitis.

In our study statistically significant improvement in mean BCVA was achieved with surgery. Increase in postoperative BCVA was achieved in 88% of the eyes. In 4 eyes with CRVO, stage 3 MH, DTRD and CNVM, visual acuity remained the same, whereas in one eye with CRVO, it decreased during follow-up. That eye had optic disc pallor and macular atrophy at the last visit.

In this series, patients' complaint of foreign body sensation was localized in the quadrant of the eye where the conjunctiva was sutured over the 20 g sclerotomy. The 25 g sutureless vitrectomy avoids suture-related irritation or local inflammatory reaction at the sclerotomy sites.[2] It has been proposed that there is a reduced postoperative inflammatory reaction and faster postoperative recovery with the 25 g sutureless vitrectomy compared with the conventional method of PPV.[5,7] In their randomized, controlled series, Kellner et al,[5] reported that conjunctival injection and postoperative pain was significantly less in eyes that underwent 25 g vitrectomy compared to the eyes that underwent 20 g vitrectomy. In our study, we observed similar findings. With 25 g sclerotomies, conjunctival dissection, cauterization, and frequently suturing are avoided, which is an advantage for eyes with corneal or conjunctival diseases such as dry eye, and eyes with existing filtering blebs or shunts. In this combined vitrectomy technique, there is the advantage of causing less conjunctival trauma with two 25 g scleral entries, allowing the surgeon to leave no conjunctival scars in positions related to previous 25 g incisions for possible future surgeries that may require healthy conjunctiva, such as glaucoma filtering procedures.

Yanyalı et al,[20] reported that no significant corneal surface and astigmatic changes were observed in the early postoperative period after 25 g PPV. Gallway et al,[21] reported recently that surgically induced astigmatism is significantly lower with 25 g PPV, and this can ultimately lead to a better visual and refractive outcome for the patient. Although combined PPV technique has the advantages of two 25 g sclerotomies, one 20 g sclerotomy still needs to be sutured, which may cause astigmatism in the early postoperative period, and delay postoperative visual recovery. However, postoperative astigmatism was not evaluated in our study.

The retrospective, nonrandomized, noncontrolled nature and the relatively short follow-up time are the limitations of this study.

This series demonstrates that combined 25 g and 20 g pars plana vitrectomy technique can be performed successfully for the treatment of a variety of vitreoretinal diseases. The addition of one 20 g sclerotomy enables the surgeon to use angled instruments like subretinal forceps, angled microscissors, or large instruments like phacofragmatomes, and foreign body forceps not yet available in 25 g size, and helps to expand the indications of 25 g vitrectomy. Using this combined technique, the surgeon can perform extensive dissection as indicated in eyes with PVR or diffuse diabetic traction retinal detachments. Meanwhile, using familiar 20 g instruments for the surgeon's dominant hand allows him to perform certain surgical maneuvers like membrane peeling comfortably. Since 25 g vitrectomy technique requires a learning period to become comfortable with the smaller, more flexible intraocular instruments, a combined 25 g and 20 g vitrectomy technique can be ideal to provide an easier transition from 20 g to 25 g sutureless technique while obviating the need to acquire a complete set of 25 g instruments. Being able to employ this combined technique when we do not have the required disposable 25 g instrument for a specific surgery decreases the cost of the surgery while maintaining the advantage of reduced surgical trauma.

In conlusion, combined 25 g and 20 g vitrectomy is an effective and safe technique for the surgical treatment of a variety of vitreoretinal diseases, although we recommend careful intraoperative monitoring of IOP and assurance of normal IOP at the conclusion of the surgery. Further prospective randomized and controlled studies with larger series and longer follow-up are warranted to determine the possible advantages of combined 25 g and 20 g vitrectomy technique compared with either 20 g vitrectomy or 25 g vitrectomy techniques.

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