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HyperVit®

Comparison of the Intraocular Pressure Control Performance with 27 Gauge Dual-Cutting and Previous Generation Single-Cutting Beveled Vitrectomy Probes

Valeri KOLESNITCHENKO¹, Ying ZHU², Vara WUYYURU²

Abstract Details



PURPOSE:

To evaluate intraocular pressure (IOP) control performance of 27 Gauge (Ga) dual- and single-cutting beveled vitrectomy probes under different settings.



METHODS:

27Ga dual-cutting 20K cuts-per-minute (cpm) and single-cutting 10K cpm beveled vitrectomy probes were driven by a dual-pneumatic vitrectomy system with IOP control to aspirate solution in an eye model. Six samples were tested under core duty cycle and vacuums of 250mm Hg and 650mm Hg. Cut rates ranged from 2,500 cpm to 10,000 cpm for 10K probes and from 2,500 cpm to 20,000 cpm for 20K vitrectors.



RESULTS:

Without IOP compensation, 27Ga 20K probes' IOP was similar for all cut rates. IOP ranged from 22.71 ± 0.30 mmHg to 22.81 ± 0.37 mmHg for 250 mmHg, and 7.93 ± 0.46 mmHg to 8.33 ± 0.32 mmHg for 650 mmHg. 10K probes' IOP ranged from 25.47 ± 0.38 mmHg to 27.46 ± 0.43 mmHg for 250 mmHg and 16.14 ± 0.77 mmHg to 19.30 ± 0.77 mmHg for 650 mmHg. When IOP control was enabled, IOP levels for 10K and 20K probes were similar and both had no significant difference under different cut rate. IOP of 20K probes at maximum cut rate obviously increased to 29.24 ± 0.75 mmHg for 250 mmHg, and 27.42 ± 2.64 mmHg for 650 mmHg compared to result without system's IOP intervention.



CONCLUSIONS:

27Ga dual-cutting 20K cpm vitrectomy probes provide a more constant IOP level compared to single-cutting 10K cpm vitrectors under different cut rates without IOP compensation. When IOP control was enabled, there was no significant difference of IOP for 20K probes and 10K probes.

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Intraocular Pressure Compensation Performance for 25 Gauge Dual-Cutting and Single-Cutting Beveled Vitrectomy Probes Comparison

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Abstract Details



PURPOSE:

To understand intraocular pressure (IOP) compensation performance for 25 Gauge (Ga) dual- and single-cutting beveled vitrectomy probes under different system settings.



METHODS:

25 Ga 20K cuts-per-minute (cpm) and 10K cpm vitrectomy probes were driven by a vitrectomy system with IOP control to aspirate in an eye model. Six samples were tested under core duty cycle and varying vacuums. Both system IOP compensation enabled and disabled settings were used.



RESULTS:

Different from results of 10K probes without IOP compensation, changing the cut rate did not generate a significant difference for 20K probes. 20K probes' IOP at maximum cut rate was 21.96 ± 0.6 mmHg for 250 mmHg, and 7.47 ± 0.98 mmHg for 650 mmHg. When IOP control was enabled, IOP levels for 20K probes and 10K probes were similar and not significantly influenced by cut rate changes. 20K probes' IOP at maximum cut rate increased to 32.32 ± 1.07 mmHg for 250 mmHg, and 37.12 ± 4.04 mmHg for 650 mmHg compared to result without IOP compensation.



CONCLUSIONS:

25 Ga dual-cutting 20K cpm vitrectomy probes have a more constant IOP when cut rate changes without IOP control compared to the previous generation single-cutting 10K cpm vitrectomy probes. Using IOP compensation can help surgeons to keep the eye at stabilized IOP ranges during aspiration of 25 Ga dual-cutting 20K cpm vitrectomy probes and maintain the efficiency of aspiration.

HyperVit®

Early Clinical Experience with a 20000 Cut Rate, Beveled-Tip, 25-Gauge Microincisional Vitrectomy System

Harvey UY¹, Pik Sha CHAN-UY², Jordan FAMADICO²

Abstract Details



PURPOSE:

To report our initial experiences and clinical outcomes using a 20000 cuts-per-minute (cpm), beveled-tip, 25-gauge cutter probe system for various vitreoretinal diseases.



METHODS:

Prospective, interventional case series of 50 consecutive eyes undergoing an assortment of vitreoretinal procedures by 3 attending surgeons utilizing a 20000 cpm, 25-gauge, beveled-tip, microincisional vitrectomy system to treat common vitreoretinal conditions. Clinical outcomes include achievement of surgical objectives, operative times, number of surgical steps, usage of ancillary instruments, corrected distance visual acuity (CDVA), surgeon assessment of amount of pulsatile traction (0=none, 10=inadvertent retinal trauma occurs repeatedly from retinal traction), adverse events.



RESULTS:

We successfully accomplished the surgical objectives in all eyes. The mean total operative duration, core, shave and total vitrectomy times were 2356 ± 708 , 233 ± 138 , 333 ± 222 and 567 ± 273 seconds, respectively. The mean number of surgical steps was 4.0 ± 1.1 . The mean number of times an ancillary instrument was placed inside the eye was 4.2 ± 2.6 . The mean CDVA at the three-month postoperative visit improved by 0.25 decimal units ($P < 0.001$). Adverse events included elevated IOP (10%) and recurrent vitreous hemorrhage (10%). Nine of 10 patients reported no postoperative discomfort. None of the eyes required sclerotomy sutures. The mean surgeon assessment of pulsatile traction was 0.9 ± 0.7 .



CONCLUSIONS:

A beveled-tip 20000 cpm cutter probe was found to be effective, efficient and safe for accomplishing the surgical objectives in a variety of vitreoretinal conditions and is associated with minimal pulsatile traction and improved fluid dynamics.

FINANCIAL DISCLOSURE: This study was supported by Alcon Investigator Initiated Trial Grant

E-poster



Advanced UltraVit®

Clinical Outcomes of a Beveled-Tip, Ultra-High Speed, 25-Gauge Pars Plana Vitrectomy Cutter Probe

Harvey UY¹, Pik Sha CHAN-UY², Jordan FAMADICO², Vicente Lorenzo CABAUG², Jose Carlo ARTIAGA²

Abstract Details



PURPOSE:

To assess the clinical outcomes and efficiency of a 25-gauge, beveled-tip, 10000 cuts-per-minute (cpm) vitrectomy cutter probe.



METHODS:

Prospective, single-center series of 50 eyes undergoing primary pars plant vitrectomy (PPV) for various indications. The probe was utilized for vitreous aspiration and other surgical maneuvers. The main outcome measures were: achievement of surgical objectives, operative times, number of surgical steps, usage of ancillary instruments, corrected distance visual acuity (CDVA), and adverse events.



RESULTS:

The surgical objectives were met in all eyes. The mean total operative duration, core, shave and total vitrectomy times were 1891 ± 890 , 204 ± 120 , 330 ± 320 , 534 ± 389 seconds, respectively. The mean number of surgical steps was 4.3 ± 1.5 . The mean number of times an ancillary instrument was placed inside the eye was 4.5 ± 1.9 . The mean CDVA at the three-month postoperative visit improved by -0.53 ± 0.56 logMAR units ($P < 0.001$). Postoperative adverse events included elevated IOP (8%), hypotony (6%), and re-detachment (2%). Majority (82%) of patients reported no postoperative discomfort. None of the eyes required sclerotomy sutures.



CONCLUSIONS:

A beveled-tip 10000 cpm probe appears to enhance surgical efficiency by decreasing vitrectomy duration and reducing ancillary instrumentation usage.

FINANCIAL DISCLOSURE: This study was supported by Alcon Investigator Initiated Trial Grant

Free Paper



General

Prognostic Factors and Long-term Outcomes of Eye-globe Perforation: Eye Injury Vitrectomy Study

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Abstract Details



PURPOSE:

To delineate anatomic and visual outcomes of injured eye globes with perforating, and to develop the prognostic indicators for perforating eyes.



METHODS:

The case series study, from a multicenter prospective cohort database. To the date of December 31st, 2018, of 63 perforating globes were selected. All cases underwent vitreoretinal surgeries or enucleations, and were followed up for at least 6 months. Demographic characteristics, basic examination for traumatized eyes, and intraocular tissue damages were recorded by surgery-in-chief. At the follow-up visit, best corrected VA, intraocular pressure, the intraocular tamponade material, retinal anatomic outcome of eye-globes, and phthisis or enucleation were evaluated.



RESULTS:

Fifty injured eyes (79%) were caused by sharp objects and 13 eyes (21%) were injured by a missiles. Twenty-two injured eyes can be anatomically restored with final vision of more than 4/200 through vitreoretinal surgery. The PVR-C (OR = 5.67, P = 0.01), area of retinectomy more than 2 times of optic disk (OR = 5.16, P = 0.04), and macular damage (OR = 6.38, P = 0.01) were correlated with unfavorable outcomes.



CONCLUSIONS:

The injured eyes with perforation can be saved through vitreoretinal surgery, the PVR-C, retinectomy more than 2 times of optic disk, and macular damage were independent risk factors for poor long-term prognosis.

FINANCIAL DISCLOSURE: This study was supported by Alcon Investigator Initiated Trial Grant

E-poster

General

Mechanism and Prognostic Indicators for Explosion-related Eye Trauma: Eye Injury Vitrectomy Study

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Abstract Details



PURPOSE:

To explore the clinical features, surgical interventions, prognosis of injured eyes following explosion, and to develop the risk factors for poor prognosis.



METHODS:

A nested case-control study. To the date of December 31st, 2018, 99 explosion-related eye-globes were selected from the Eye Injury Vitrectomy Study database, which is a multicenter prospective cohort study and began in 1990s. All cases selected underwent vitreoretinal surgery or enucleation, and were followed up for at least 6 months. Clinically meaningful preoperative variables and outcomes were used to develop logistic regression models.



RESULTS:

The unfavorable outcomes were defined as silicone oil-filled eyes, phthisis bulbi, enucleation, and anatomically restored eyes whose final BCVA is worse than initial vision after 6 months of follow-up. The proportion of unfavorable outcomes were 92.0%, 60.9%, and 66.7% in large festive fireworks, detonator, and beer bottle groups respective. The anatomic and visual outcome of injured eyes with combined injury of blast wave and projectile were worse than that of ruptured eyes (Fisher's exact = 0.041). The extrusion of iris/lens (OR = 3.20, P = 0.015), PVR-C (OR = 6.08, P = 0.036), and choroid damage (OR = 5.84, P = 0.025) are independent risk factors of unfavorable prognosis for explosion-related eye trauma.



CONCLUSIONS:

The extrusion of iris/lens, PVR-C, and choroid damage are the independent risk factors for unfavorable outcomes in explosion-related eye trauma. There is a unique injury mechanism in explosion-related eye trauma.

FINANCIAL DISCLOSURE: This study was supported by Alcon Investigator Initiated Trial Grant

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