

Comparing Two 20-gauge Trocar Systems for Sutureless Transconjunctival Vitrectomy

DORC and Synergetics systems comparable, with ease of trocar insertion.

BY NARCISO F. ATIENZA JR., MD, DPBO

Since the introduction of systems for sutureless vitrectomy surgery, there has been debate about which approach is best. We now have options for 20-, 23-, 25-, and 27-gauge instrumentation. Which can provide the best results: the most efficient surgery with the fastest healing, the least inflammation, and the fewest postoperative complications? Which is the most cost-effective? It will take time to answer all these questions.

Of the available options, 20-gauge non-trocar or trocar systems hold the possibility of providing some of the advantages of smaller-gauge systems without the need to adopt a lot of newer instrumentation in switching to transconjunctival sutureless surgery.

We retrospectively reviewed our early results with two

relatively recently introduced 20-gauge trocar systems: the Claes 20 Gauge Vitrectomy System (DORC International, Zuidland, Netherlands), and the One-Step Surgical System (Synergetics, O'Fallon, MO).¹

FIRST 40 CASES

We performed a retrospective, comparative case series review of the first 40 surgeries performed by a single surgeon with the two above-named 20-gauge trocar systems for transconjunctival sutureless vitrectomy surgery. The 40 cases with the DORC system (Figure 1) were performed from May to July 2008, and the 40 cases with the Synergetics system (Figure 2) from January to April 2009. Charts and videos for these 80

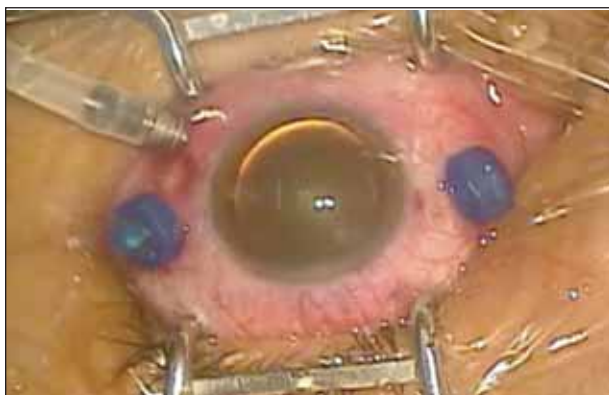


Figure 1. Claes 20 Gauge Vitrectomy System (DORC International).



Figure 2. One-Step Surgical System (Synergetics).



Figures 3-5. Sclerotomies with the DORC system were created using a two-step procedure; a regular 20-gauge microvitrectomy knife is inserted at an estimated angle of 10° to 20° using the DORC fixed footplate; then the trocar is inserted.



Figures 6-8. For insertion of the Synergetics trocars, the bladed trocar inserter is used. The same DORC footplate is used with the Synergetics trocars, as it provides good stabilization of the globe.

cases were reviewed.

Sclerotomies with the DORC system were created using a two-step procedure; a regular 20-gauge microvitrectomy knife is inserted at an estimated angle of 10° to 20° using the DORC fixed footplate; then the trocar is inserted (Figures 3-5). For insertion of the Synergetics trocars, the bladed trocar inserter is used. I use the same DORC footplate with the Synergetics tro-

cars, as it provides good stabilization of the globe (Figures 6-8). I always make sure that I see the tip of the trocar after inserting, to ensure that it does not end up in the subretinal space. Standard wide-angle vitrectomy is then performed.

The trocars are removed either by reinserting the guide inserter on the trocar before pulling it out of the sclerotomy, or by pulling out the trocar directly without

TABLE 1. COMPARISON OF TWO 20-GAUGE TROCAR SYSTEMS: DEMOGRAPHICS AND INDICATIONS

	DORC	Synergetics
Demographics		
Male	27	24
Female	13	16
Age (mean)	25-73 (54.25) years	25-78 (55.05) years
Indications		
Vitreous hemorrhage	15	14
PDR + TRD	10	13
Macular hole	5	3
Epiretinal membrane	4	7
Retinal detachment	6	3
<i>PDR + TRD = proliferative diabetic retinopathy with traction retinal detachment</i>		

TABLE 2. COMPARISON OF TWO 20-GAUGE TROCAR SYSTEMS: SURGICAL TIME AND IOP

	DORC	Synergetics
Surgical time (average)	14.7 - 82.5 (37.25) minutes	13.2 - 81.8 (43.13) minutes
IOP 1 day postop (average)	8 - 23 (14.92) mm Hg	7 - 20 (13.8) mm Hg
<i>IOP = intraocular pressure</i>		

the guide. The sclerotomy sites are checked for leakage before the conclusion of the case. Standard postoperative care instructions are given.

Vitreous substitutes used in these cases included SF⁶ or C3F⁸ gases, silicone oil, balanced saline solution, and air. I used more air/fluid exchanges in the second series, as I have found that air has a greater surface tension and it seals the sclerotomies better.

RESULTS

Baseline visual acuities and intraocular pressures were similar in the two groups. The demographics and the mix of indications for surgery was also similar between the groups (Table 1).

Intraoperative hypotony was noted more frequently in the cases performed with the DORC system (n=3) compared with the Synergetics system (n=1). Hypotony usually occurred during instrument exchange.

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Suturing of sclerotomies was performed in an equal number of cases in the two groups (n=3 in each group). All additional suturing required only one suture on only one sclerotomy. All three of the cases requiring sutures with the DORC system were performed with silicone oil. Of the cases requiring sutures with the Synergetics system, two had silicone oil and one had balanced saline solution. No additional suturing was done postoperatively in either group.

No postoperative complications were noted at up to 3 months follow-up after the procedure, including no occurrences of endophthalmitis and no retinal detachments.

Surgical time was similar with both systems. Intraocular pressures at 1 day, 1 week, and 1 month were also similar (Table 2).

COMPARISONS AND CONCLUSIONS

These two 20-gauge trocar systems are comparable for use during transconjunctival sutureless surgery. However, we observed some differences in the course of this retrospective review of cases.

The DORC instruments tend to glide easily during instrument exchange, while the Synergetics instruments tend to experience more friction. Because of this difference in friction, the trocars of the DORC system are not easily removed during instrument exchange, while the Synergetics instruments may tend to pull the trocars along when an instrument is withdrawn.

The DORC system is reusable, while the Synergetics instrumentation is single-use. The silicone stopper of the DORC system is only partially effective, while the flexible cannula of the Synergetics system tends to self-seal during surgery.

Trocar insertion was easy with both systems. Closure rate and need for suturing were similar. The incisions tended to close faster with the Synergetics system because the trocar conforms better to the slit-like sclerotomies, unlike with the DORC system, which uses a rigid, round design.

Use of angled instruments is limited because of the systems' designs. The availability of better instrumentation in the future will be of benefit, including scissors and picks designed to pass through a 20-gauge system, and embedded self-sealing valves.

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Narciso F. Atienza Jr, MD, DPBO, is in practice at the Cardinal Santos Medical Center; St. Luke's Medical Center, Quezon City; and the Legaspi Eye Center in the Philippines. Dr. Atienza states that he has no financial interests relevant to the products or companies discussed in this article. He may be reached via e-mail at retinasurgeon@gmail.com.



1. Atienza NF, Say EA, Garcia CP, Tanqueco RE, Say AS. Comparison between the DORC (Claes) and Synergetics 20 gauge trocar systems for sutureless transconjunctival vitrectomy surgery. Paper presented at: Retina Congress 2009; September 30 - October 4, 2009; New York.