Reduced Incidence of Sclerotomy Related Breaks during 23-Gauge Vitrectomy

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Introduction

Sclerotomy related breaks are a commonly noted iatrogenic complication during vitrectomy. This dreaded complication has been reported by Ramkissoon YD et al (1) to have occurred in 109 of 645 vitrectomized eyes! All patients underwent 20g vitrectomy for tractional RD, macular hole, epiretinal membranes or nucleus drop. Most of these eyes were phakic.(95% confidence interval, 1.42-3.96, P = 0.001)

Unless a thorough peripheral retinal search is done at the end of the procedure and retinal breaks treated immediately, this can result in disastrous complications like giant retinal tears and retinal detachments. In cases of organized vitreous hemorrhage, it may be difficult to assess the retinal periphery through the skirt of organized blood, which is preferably left in the eye.

This study was done to find out if 23 gauge vitrectomy would reduce the incidence of these sclerotomy related breaks.
To determine the incidence of sclerotomy related breaks during 23 gauge and 20 gauge vitrectomy.
Methods

- A prospective comparative study was conducted in a tertiary eye institute. Eyes with vitreous hemorrhage with or without tractional retinal detachment were included in this study.

- 22 consecutive cases underwent 20 gauge vitrectomy following which the next 38 consecutive cases underwent 23 gauge vitrectomy by the same surgeon. PVD was induced in all cases. In all cases the retina was carefully examined for any peripheral sclerototomy related breaks.

- In our study, patients were followed up for at least 3 months after surgery.
Results

- 3 of 22 eyes (13%) which underwent 20 gauge vitrectomy had sclerotomy related breaks. All three were phakic eyes.

- None of the eyes which underwent 23 gauge vitrectomy had a even single sclerotomy related break.
Though the numbers are few, this small study shows that 23 gauge vitrectomy may be safer to perform than 20 gauge vitrectomy.
Sclerotomy-related and peripheral retinal breaks are more commonly encountered in 20 gauge vitrectomy\(^{(2)}\). In this method, repeated instrument entry through the scleral port causes a traction on the peripheral vitreous skirt, thereby increasing the risk of peripheral retinal tears.
When the 23 gauge system is used, the trocar keeps the port open, and instruments are repeatedly introduced directly into the vitreous cavity. The direction of instrument entry is constant and vitreous is rarely pulled away from the retinal periphery.

In 20 gauge vitrectomy, repeated instrument entry might be the single most important causative factor in the occurrence of sclerotomy related breaks.

In phakic eyes, the sclerotomy is made more posterior to the limbus and there is a tendency to cut the vitreous in a downward direction to avoid lens touch. These factors may contribute to a higher risk for sclerotomy related breaks in phakic eyes.
Drawbacks

- This study involves a small number of patients. A larger randomized control trial is required to prove the safety of 23 gauge vitrectomy.

- Long term follow up may be beneficial to determine any late incidence of peripheral retinal breaks.
