Abstract:

Retinal Displacement following Pneumatic Retinopexy vs Pars Plana Vitrectomy for Rhegmatogenous Retinal Detachment (ALIGN STUDY)

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Purpose:

A significant proportion of patients undergoing pars plana vitrectomy (PPV) for rhegmatogenous retinal detachment (RRD) repair have post-operative retinal displacement on fundus autofluorescence (FAF) imaging. The purpose of this study was to compare the rates of retinal displacement following PnR vs PPV and to determine if retinal displacement was associated with functional outcomes.

Methods:

A prospective multicenter cohort study recruited consecutive patients with primary macula off RRD where PnR or PPV was planned at three academic vitreoretinal units in Canada and the UK from June 2018 to December 2019. The primary outcome was the proportion of patients with post-operative retinal displacement at three months detected by retinal vessel printings (RVP) on widefield FAF imaging (Optos) evaluated by two independent masked graders. Secondary outcomes included the association of retinal displacement with objective aniseikonia measurements (Awaya).

Results:

173 eyes were enrolled (PnR=87, PPV=86). There were no differences in baseline characteristics. Primary anatomic reattachment rate was 80.5% (70/87) and 91.9% (79/86) in the PnR and PPV groups respectively (p=0.03). On an intention to treat basis, the proportion of eyes with RVPs on FAF imaging was 25.9% (21/81) in the PnR group and 51.4%(36/70) in the PPV group (p=0.001) among those with gradable images. Among the eyes in the PnR group that had retinal displacement, 52.38% (11/21) had failed primary pneumatic with subsequent PPV. Among patients who had primary anatomic reattachment with gradable images, the rate of retinal displacement was 15.2% (10/66) in the PnR group vs 52.3% (34/65) in the PPV group (p<0.001). The presence of ‘zone one’ (macular region) displacement was higher in the PPV group (PnR=18.5%; PPV 42.9%; p=0.001). Mean aniseikonia score was 4.6 ± 6.1 and 2.3 ± 3.5 in patients with and without retinal displacement respectively (p=0.015).

Conclusions:

This is the first prospective study to compare retinal displacement rates following PnR versus PPV for RRD repair. PPV is associated with significantly higher rates of retinal displacement compared to PnR. A PnR success gives the patient the greatest chance of avoiding retinal displacement. Patients with retinal displacement had worse objective aniseikonia measurements compared to patients without retinal displacement.