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## **Perfluorocarbon droplets in the anterior chamber – Case Report**

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## **Abstract**

Perfluorocarbonated liquids (PFCL) are occasionally used in vitreoretinal surgery. In this article, we present a case of a young man who sustained a trauma to his eye resulting in a traumatic cataract and retinal detachment. He underwent combined cataract extraction, intraocular lens implantation and a vitrectomy for retinal detachment. Perfluorodecaline was used to stabilize the retina during the surgery. One day after surgery he was found to have many small bubbles of perfluorodecaline settling in the lower half of the anterior chamber. He was managed conservatively and followed up for a period of 1 year during which there were no sequel for the retained PFCL.

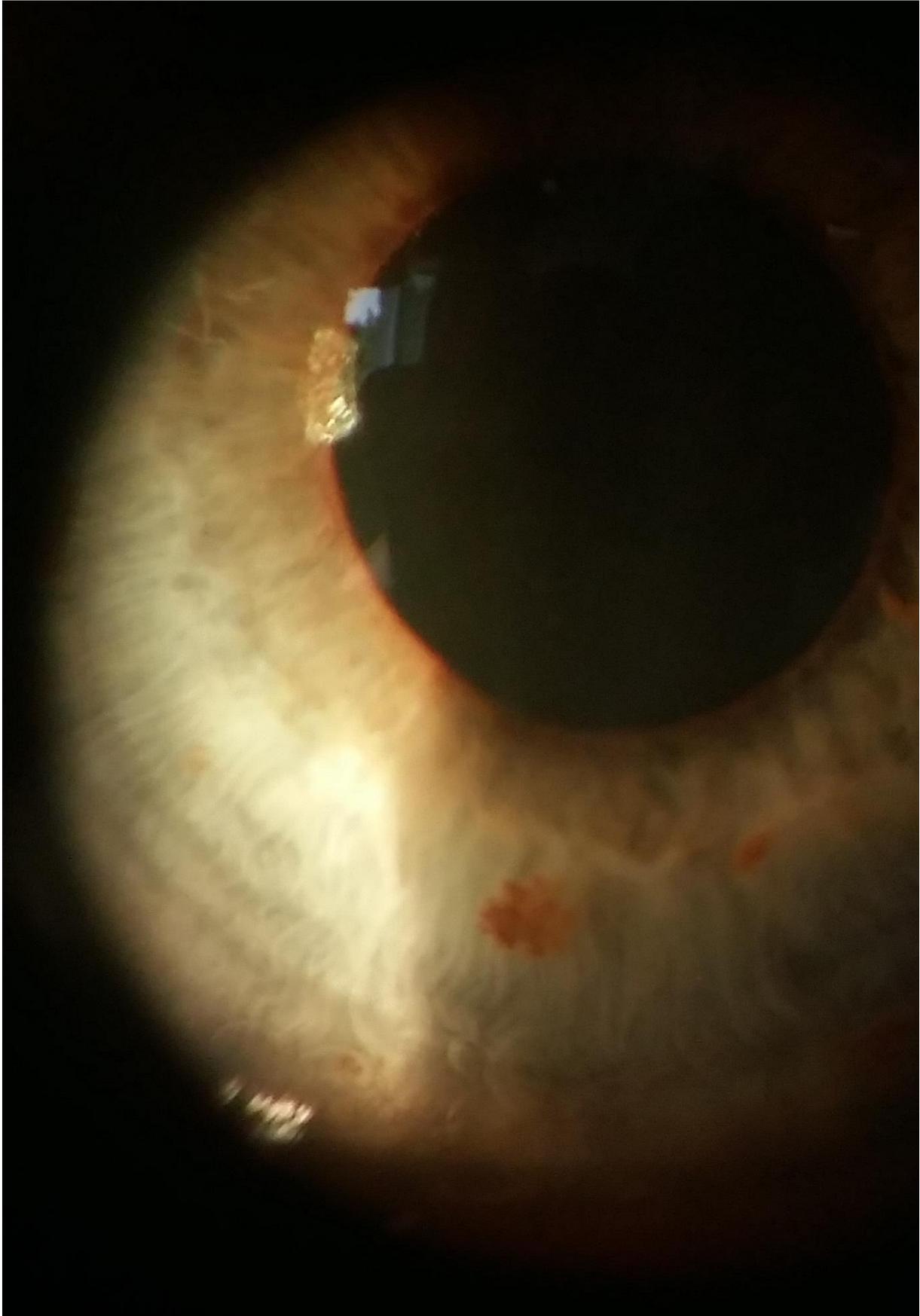
**Key words:** perfluorocarbon liquids, perfluorodecaline, anterior chamber, vitrectomy, vitreoretinal surgery

## **Introduction**

Since the introduction of PFCLs in late 80s, they have revolutionized the surgery of retinal detachment and became an indispensable tool in vitreoretinal surgery.<sup>[1]</sup> PFCLs are characterized by high specific gravity relative to water and it is agreed generally that they should be removed at the end of the surgery; however, occasionally residue may be retained. Although mostly innocuous, some complications can result from such remnant in the anterior chamber such as glaucoma, persistent inflammation or even corneal toxicity.<sup>[2]</sup> Luckily, we have followed our patient for a period of 1 year and the PFCL was tolerated and he did not develop any complications.

## **Case Report**

A 30-year-old male patient sustained a trauma to his right eye few days prior to presentation which has resulted in traumatic cataract and retinal detachment. The patient underwent combined cataract extraction and implantation of an intraocular lens, and pars plana vitrectomy. During the surgery, perfluorodecaline was used as PFCL to stabilize the retina during intraocular manipulation. At the end of the surgery, all intraocular perfluorodecaline was believed to be removed. Then the case was concluded. In the first post-operative day the patient was examined and multiple bubbles of perfluorodecaline were seen in the anterior chamber (Figure1). Given that his intraocular pressure was within normal limits (14 mm Hg), and the inflammation in the anterior chamber was within the accepted limits for such a surgery in the first post-operative day, a decision was taken to observe the patient without intervention. The patient was then followed up during a period of 1 year, during which he was asymptomatic. His intraocular pressure and anterior chamber was assessed in every visit without the development of any complications.



*Figure. 1.* A color anterior chamber image shows the perfluorodecaline bubbles in the anterior chamber.

## **Discussion**

PFCLs are fluids that are characterized by being odorless and colorless, with low viscosity, and high specific gravity that is heavier than water. These features make them highly useful adjuncts in vitreoretinal surgery. Being clear, allow surgical maneuvers under a visible PFCL-fluid interface. Their weight flattens the retina. They are usually easy to inject and aspirate.<sup>[2]</sup> As an intraoperative tools, they are especially useful for flattening the retina in retinal detachment, cases complicated with proliferative vitreoretinopathy (PVR), to reattach giant retinal tears, to protect the macular area or lift dropped lenses, as well as to drain suprachoroidal hemorrhage and to stop bleeding<sup>[3]</sup>. The use of PFCL, as a vitreoretinal intraoperative tool, does not appear to induce any inflammatory reaction or iatrogenic damage, as it has a good safety profile. However, toxicity from extended intraocular use has been reported in animals and humans when PFCLs are retained for more than 48 hours. This toxicity causes an inflammatory response, and that is why they should be removed at the end of surgery.<sup>[4]</sup> If they were kept inadvertently in the eye however, they can cause complications like glaucoma, persistent inflammation and corneal toxicity.<sup>[5]</sup> When PFCL sometimes migrates to the anterior chamber, they end up inducing corneal edema and endothelial cell loss after 4 weeks of PFCL contact. They may also cause keratic precipitates, deep corneal stromal vessels, and nuclear cataract. Histopathologic examination showed epithelial edema, an extensively deficient Bowman membrane, corneal stroma vascularization with inflammatory cells, and PFCL engulfed in keratocytes and macrophages around the vessels. The endothelium was largely deficient.<sup>[6]</sup> Although usually innocent and none of these complications develop; when left for more than 3 weeks, they usually cause toxicity. Nevertheless some of them are reversible if the PPFCL was aspirated from the anterior chamber.<sup>[7]</sup> In our case, the patient was strictly followed up for a period of 1 year with checking up his anterior chamber looking for any signs of complications; fortunately he developed none. That is why the decision was taken just to follow him up without intervention.

## **Conclusion**

Although fluorocarboned liquids in the anterior chamber can be evacuated, it seems that it is a benign rare complication of vitreoretinal surgery that can be followed up without the need for any intervention.

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