

Abstract:

Polymethylmethacrylate posterior chamber intraocular lens opacification is uncommon complication of cataract and intraocular lens (IOL) surgery. It is termed snowflake degeneration after laboratory studies of explanted opacified intraocular lens (IOL). It may progress to a degree compromising vision and necessitate intraocular lens (IOL) exchange or explanation.

A 43-year-old Saudi Arabian man presented with minor visual disturbance but good visual acuity after he had cataract surgery of a Polymethylmethacrylate Posterior Chamber Intraocular Lens implantation despite the dense opacification of the optic of the intraocular lens (IOL).

Conclusion:

Opacification of Intraocular Lens (IOL) may stay stable with minimal glare but excellent vision. Do not need any intervention but close observation.

Key words:

Polymethylmethacrylate, Intraocular lens opacification

Case Report:

A 43-year-old Saudi diabetic man had a history of right eye phacoemulsification and insertion of 19.50 diopter Polymethylmethacrylate (PMMA) posterior chamber intraocular lens 19 years ago and presented with a history of visual disturbance of the right eye for 2 years.

His vision was 20/40 right eye which improved by pinhole to 20/30 and 20/20 left eye. Intraocular pressure was normal in both eyes. Slit lamp examination of right eye showed central whitish pearly dots like deposits measured 2.5 x 2.6 mm in the Polymethylmethacrylate (PMMA) intraocular lens (IOL)(Figure 1). Slit lamp examination of the left eye showed scattered mild deposits(Figure2) . Funduscopy was normal in both eyes.

Our last impression was stable opacification of Polymethylmethacrylate (PMMA) intraocular lens (IOL).

Discussion:

Snowflake degeneration is a slowly progressive opacification of Polymethylmethacrylate (PMMA) intraocular lenses (IOL), occurring sometimes 10 years or more after implantation.^{1,2} The opacities observed within intraocular lens (IOL) optic has the aspect of crystalline deposits. The term “snowflake” related to the aspect of the individual lesion under high magnification light microscopy.^{1,2} The optic lesions start as scattered white brown spots within optic of intraocular lens and remain stable or slowly progressive.^{1,2} Some may gradually increase in intensity and numbers eventually reaching a point at which visual acuity loss may necessitate removal or exchange of the intraocular lens.^{1,2} Our patient the snowflake lesions were limited to

the central 2.5 mm of the optic (figure 1)with stable visual acuity and minimal visual disturbances for years .

The snowflake lesions per se are dry lesions and should be differentiated from glistening. Glistening are fluid filled vacuoles and were largely described in association with hydrophobic acrylic lenses but can also be associated with other materials, including Polymethylmethacrylate (PMMA) intraocular lens.^{3,4} Our patient finding is corresponding to that reported cases.

It has been suggested that manufacturing variations in some lenses fabricated in 1980's to mid 1990's may be responsible for this problem. The late change in the Polymethylmethacrylate (PMMA) material process is facilitated by long term ultraviolet (UV solar) exposure. This is supported by two pathologic observations. First, many opacities have indeed been clustered in the central zone of the optic, extending to the mid-peripheral portion but often leaving the distal peripheral rim free of the opacities. This observation would support the hypothesis that the slow and sometimes progressive lesion formation noted here might relate to the fact that the intraocular lens central optic is exposed to ultraviolet (UV) light over an extended period, whereas the peripheral optic may be protected by the iris. This is snowflake lesions like the situation in our patient. Furthermore, the opacities are present most commonly and intensely within the anterior third of the optic's substance. Because the anterior strata of the optic are the first to encounter the ultraviolet (UV) light, this might explain why the opacities are seen more frequently in this zone.^{1,2} The manufacturing process of Polymethylmethacrylate (PMMA) uses many different polymerization techniques and various components such as ultraviolet (UV) absorbers and initiators. It is possible that ultraviolet (UV) radiation is a contributing factor; however, the exact pathogenesis can, as of now, only be hypothesized. Potential causes of a snowflake lesion include (1) insufficient post annealing of the cured Polymethylmethacrylate (PMMA) polymer; (2) excessive thermal energy during the curing process, leaving voids in the polymer matrix; (3) non-homogenous disbursement of the ultraviolet (UV) chromospheres and/or thermal initiator into the polymer chain; and (4) poor filtration of the precured monomeric components (monomethyl methacrylate, UV blocker, thermal initiators). Another possible pathogenic factor could be an inadvertent use of excessive initiator substance during the polymerization process that may facilitate the formation of the snowflake lesions.^{1,2}

The emergence of this complication could have represented a true disaster, except for the fact that many of the patients implanted with these intraocular lenses (IOLs) are now deceased. However, there are probably still sufficient numbers of patients living with varying stages of this complication. This necessitates that today's ophthalmologist be aware of diagnose and know when not to explants and/or exchange these lenses. It is important to know the nature of this syndrome in order to spare new elderly patients and their doctors of unwarranted anxiety about the cause of visual problems or loss and also to obviate request for unwarranted diagnostic testing.⁵ Our patient was diagnosed initially as posterior capsule opacities and planned for (YAG) Laser capsulotomy which carries some complications like shooting up of intraocular pressure and retinal injury, but was realized by a senior that it is not and the impression was polymethylmethacrylate intraocular lens deposits . The deposits looks more grey and faint in the left eye (figure2).

In conclusions:

There are different factors related to patient's associated conditions, the intraocular lens (IOL) manufacturing process and storage may be involved in a process of opacification. The important fact in recognizing the snowflake complication of polymethylmethacrylate (PMMA) intraocular lens (IOL) is to alert surgeons about the nature of the lesion so they will not alarm patients or require invasive procedures. Our patient is stable with no need for intraocular lens exchange nor YAG laser capsulotomy.

References:

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