Femtosecond Laser Assisted Cataract Surgery in Special Situations – White Cataracts, Shallow Anterior Chamber and Compromised Corneas

Dr. Samaresh Srivastava, DNB
Raghudeep Eye Hospital, Ahmedabad and Jaipur, India

Femtosecond Laser Cataract Surgery has particular advantages in certain challenging and difficult cataract scenarios.

**Intumescent, White Cataracts:**

The most challenging step in an intumescent cataract is to successfully achieve a complete anterior capsulorhexis. It is not uncommon to see the Argentinian Flag sign in these cases as soon as the surgeon nicks the anterior capsule. The biggest advantage of the femtosecond laser in these situations is the ability to create a continuous capsulorhexis. Further, the size, the diameter, and the centration of the capsulorhexis can be customized by the surgeon. Additionally, clear corneal incisions as well as astigmatic incisions can be made using the laser platform. In cases of white cataracts, the laser cannot penetrate optically opaque media, and, therefore, cannot create lens division. However, the ability to predictably create a round, centric capsulorhexis of a desired size is the greatest advantage of femtosecond lasers in intumescent cataracts.

*How is the Capsulorhexis Created?*

The femtosecond laser is docked onto the patient’s eye. Thereafter, the laser is programmed using the controls available on the machine. The diameter of the capsulorhexis can be selected by the surgeon. Typically, we prefer a diameter of 4.5 to 4.6mm. The capsulorhexis is centered on the limbus based on the screen. A live, anterior segment optical coherence tomography (OCT) guides the surgeon as to where the capsulorhexis will be fashioned. Now, the laser is fired and in a matter
of few seconds, the capsulorhexis is created. Next, the laser creates corneal incisions and astigmatic incisions if required.

As a second step, the patient is then wheeled into the operating room. After opening up the incisions and injecting OVD into the eye, the capsulorhexis is removed from the eye. In cases of white cataracts, trypan blue staining is helpful in identifying the rhexis, and any capsular tags, if present.

However, there are certain select cases of intumescent, white cataracts where “lens milk” maybe released as soon as the capsulorhexis is initiated by the femtosecond laser. In these cases, there are chances that there may be capsular tags left behind as the capsulorhexis may not be complete. Therefore, we recommend performing trypan blue staining and using rhexis forceps to carefully grasp and remove the rhexis.

**Shallow Anterior Chamber and Compromised Corneas:**

Femtosecond laser cataract surgery has a distinct advantage in situations where the corneal endothelium needs extra protection. The laser creates a capsulorhexis, incisions, and also divides the lens into fragments. Depending on the laser platform, there are different options for lens division. Cylindrical, cubical or pie shaped fragments are created within the lens. Here again, the live anterior segment OCT view guides the surgeon to keep a “safety offset” margin from the posterior capsule, so that there is no damage to the posterior capsule.

In shallow chambers and weak corneal endothelium cases, the laser already pre-divides the lens into fragments, thus reducing the total amount of energy dissipated within the eye. This is particularly helpful in cases of dense cataracts, where sculpting, and / or chopping require substantial expenditure of ultrasound energy.

Thus, we find that corneas are clearer even in dense cataracts with shallow chamber or weaker corneas.