While laminar resorption remains a serious complication following osteo-odonto-keratoprosthesis (OOKP) surgery, surgeons can minimise the risk and address any further complications early on with careful monitoring. Venkata Avadhanam MD told a session of the XXXVI United Kingdom & Ireland Society of Cataract & Refractive Surgeons (UKISCRS) Annual Congress.

OOKP is the keratoprosthesis of choice, with a proven track record, for end-stage corneal blindness not amenable to corneal transplantation in dry or non-blinking eyes and eyes with lid defects. It is a complex procedure, with a number of separate stages, which basically involves harvesting a tooth from the patient or a donor. A carrier lamina with a piece of tooth and jawbone, typically fashioned from a canine, is prepared and a PMMA optical cylinder is incorporated, through an aperture drilled through the centre of the dentine. The lamina is implanted in the patient’s cheek under the orbicularis muscle for two to three months to enable vascularised soft tissues to grow around it. It is then removed after 2-3 months for implantation in the eye.

“Compared to other types of keratoprostheses, the OOKP is the most successful procedure but we still have the problem of laminar resorption,” Dr Avadhanam, Anterior Segment Fellow, Sussex Eye Hospital, Brighton, said.

One of the important causes for OOKP failure is laminar resorption, occurring in an estimated 20 per cent of the patients in the UK. The risk is higher in the young and those suffering from persistent inflammation, or those in whom allografts have been implanted, he explained.

The complications of laminar resorption can be serious. The more obvious clinical signs of laminar resorption include decreased bulk, decreased visual acuity, unstable cylinder, aqueous leak, change in refraction and loss of foveal fixation.

However, the clinical signs of early laminar resorption are subtle and by the time they are noticeable significant resorption would have occurred, hence patients must be carefully monitored. CT scanning of the lamina is currently the most useful and widely employed modality of investigation for these patients, Dr Avadhanam said.

Clinical examination cannot identify volume loss in all cases but a 3D-CT imaging is particularly useful for detecting early laminar resorption before clinical signs set in. An automated laminar volume analysis with 3D-ALA (advanced lung analysis) software is a significant step forward in this technology, he reported.

Prevention, where possible is obviously the best approach to laminar resorption, and this risk can be minimised by using a tooth that is healthy with good bulk, and having a lamina size of at least 3.0mm thick with a minimum of 1.0mm margin of dentine around the optical aperture, he said.

When laminar resorption does occur, proactively addressing the inflammation with immunosuppression, reducing osteoclastic activity using Fosamax (a bisphosphonate), and careful and more frequent clinical and radiological monitoring of the patient are advisable. In addition, prompt surgery - repair of buccal mucous membrane and pre-emptive laminar removal/exchange, may be needed if substantial resorption develops, Dr Avadhanam elaborated.

In recent years interest in synthetic OOKP laminae has increased. Some patients do not have suitable teeth and it is now known that allografts and tibial keratoprostheses have a shorter lifespan, thus the synthetic option can be more suitable, he acknowledged.

There are many potential advantages of the synthetic option. Research is ongoing in improving this technology, Dr Avadhanam concluded.

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