Suprachoroidal mesenchymal stem cell implantation in pediatric patients with degenerative retinal diseases: 6 month follow-up results

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AIM

Prospective clinical study

To investigate the safety and efficacy of suprachoroidal mesenchymal stem cell (MSC) implantation in pediatric cases.

The method was proven to be safe and effective in adults in our previous studies.

20 eyes of 11 pediatric patients with degenerative retinal diseases were included in the study.

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METHODS

Limoli Retinal Restoration Technique (Suprachoroidal), 5 milion UC-MSC

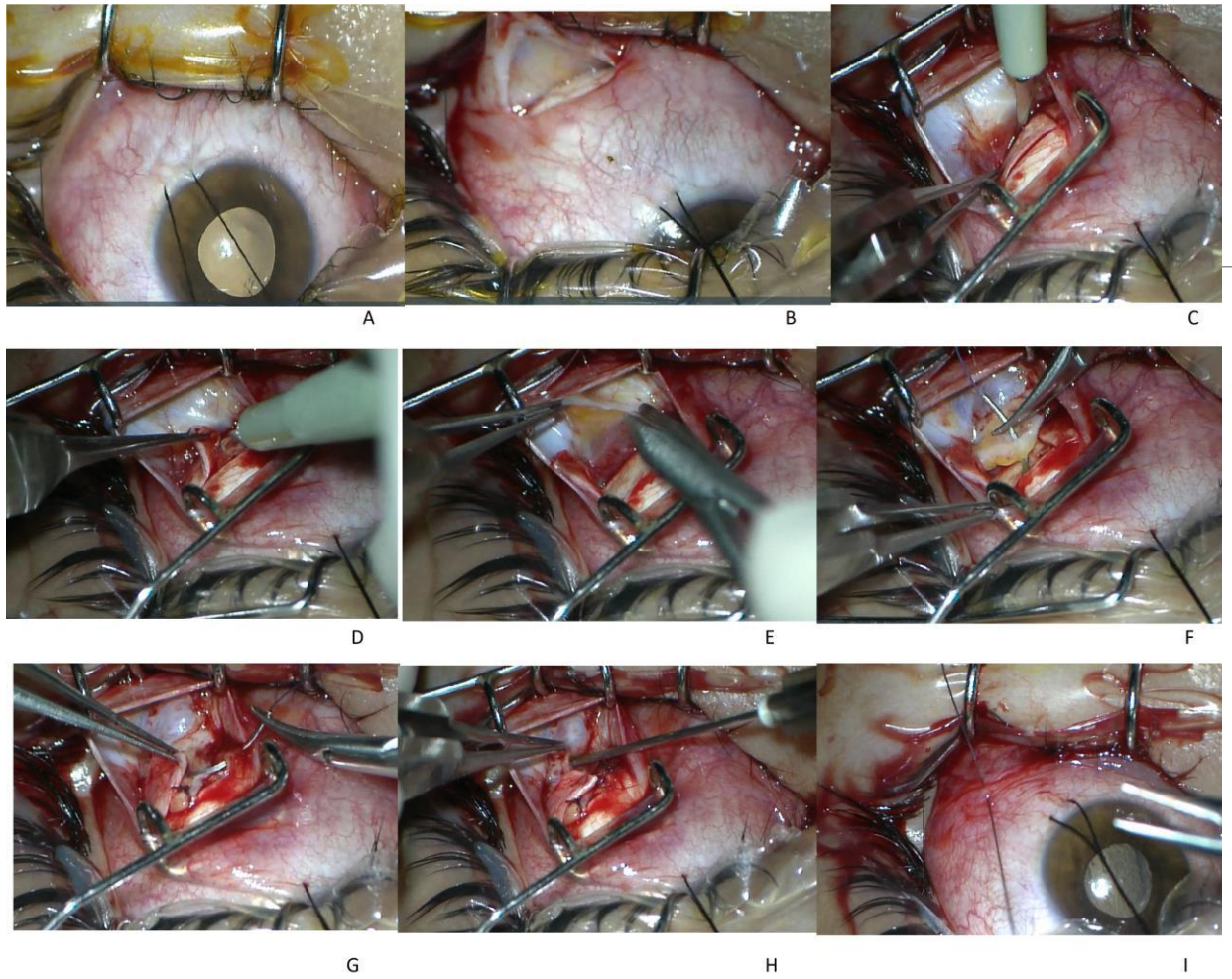
Patients were evaluated on the first day, first month, third and sixth month postoperatively.

BCVA, anterior segment and fundus examination, color photography

Optical coherence tomography (OCT), Visual field examination (VF)

Fundus fluorescein angiography (FFA), Multifocal electroretinography (mf ERG)

Tests were performed at baseline and at the end of the sixth month.



A. The globe was deviated to the superonasal quadrant with a deviation suture.

B. The conjunctiva and tenon capsule were dissected with a tenotomy scissor at the inferotemporal quadrant at 8 mm from the limbus.

C. The conjonctiva and tenon capsule were seperated from the surgical area with a pediatric eye speculum. A deep scleral flap of about 5 X 5 mm was opened by a radial hinge at the inferotemporal quadrant.

D. The sclerectomy was deep enough to allow viewing of the color of the choroid. The distance between the grafted stem cells and choroid was reduced by deep sclerectomy to enhance the paracrine effect of transplanted stem cells.

E. A flap from the orbital fat was extracted from a gap above the inferior oblique muscle.

F. This fat tissue was laid on the scleral bed and sutured with 6/0 vicryl suture at the proximal edge of the scleral bed.

G. The scleral flap was then sutured above the fat pe

H. The remaining space between the autologous fat
was filled with 1 cc of $5x10^6$ UCMSCs. The cell
needle. I. The conjunctiva was sutured with 8/0 v

RESULTS

Nine of the patients had Retinitis Pigmentosa (RP) and two had Stargardts'macular disease

Age of the patients ranged between 5 and 18 years.

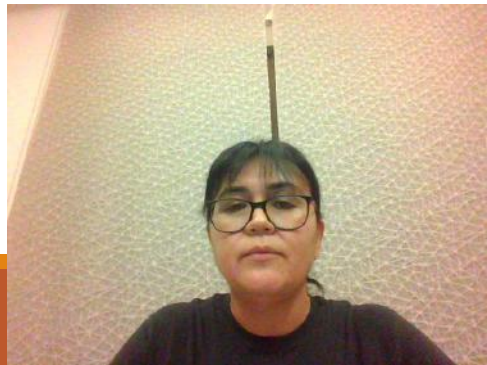
Preoperative BCVA was between 0.05 and 0.60 Snellen lines.

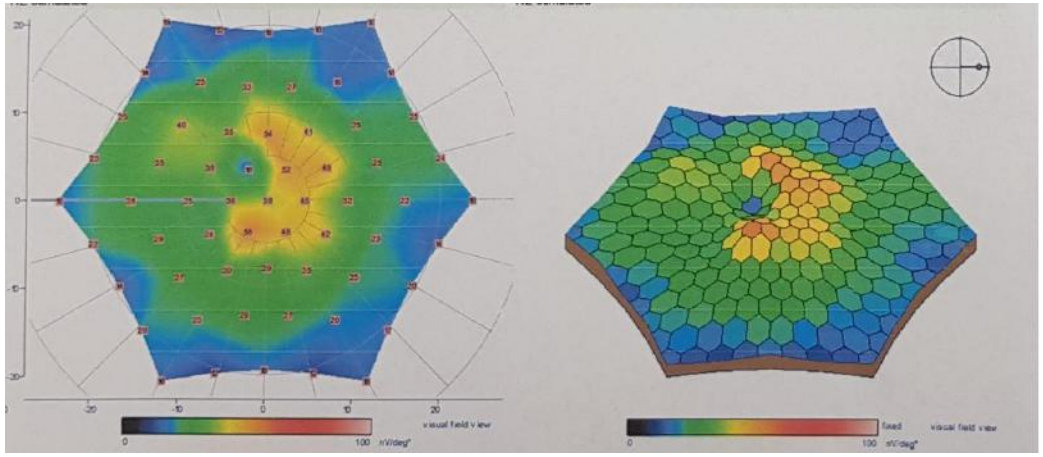
None of them had any systemic or ocular complications.

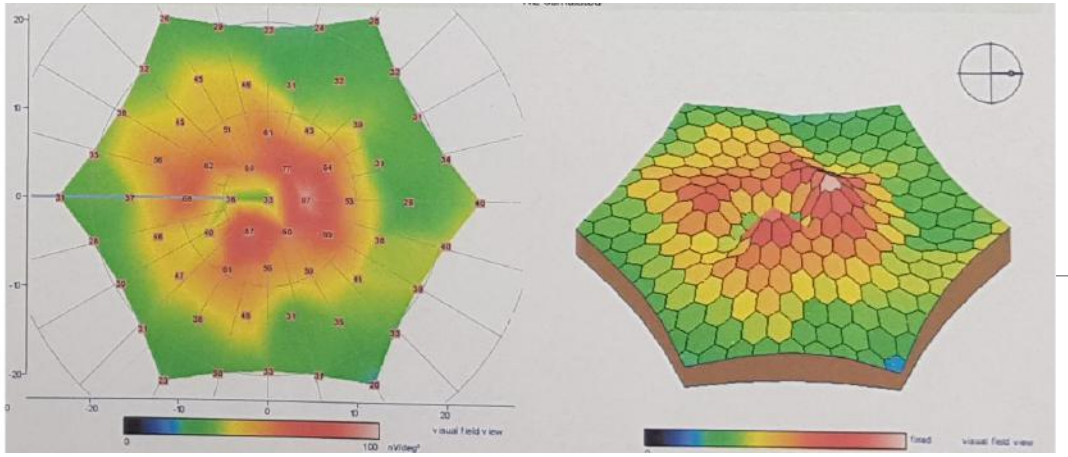
BCVA improved in 15 eyes and remained unchanged in 5 eyes.

The eyes with visual acuity improvement also showed improvement in visual field and mf ERG recordings.

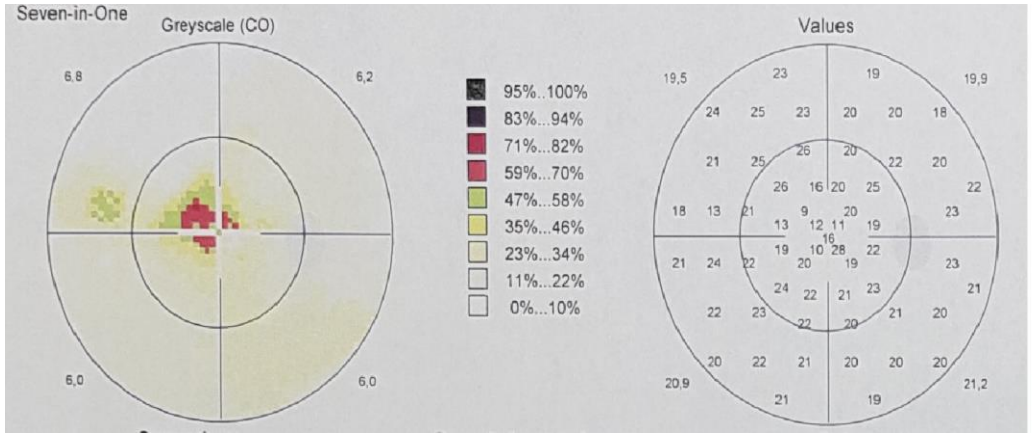
We found no ocular pathologies on OCT and FFA of the patients.

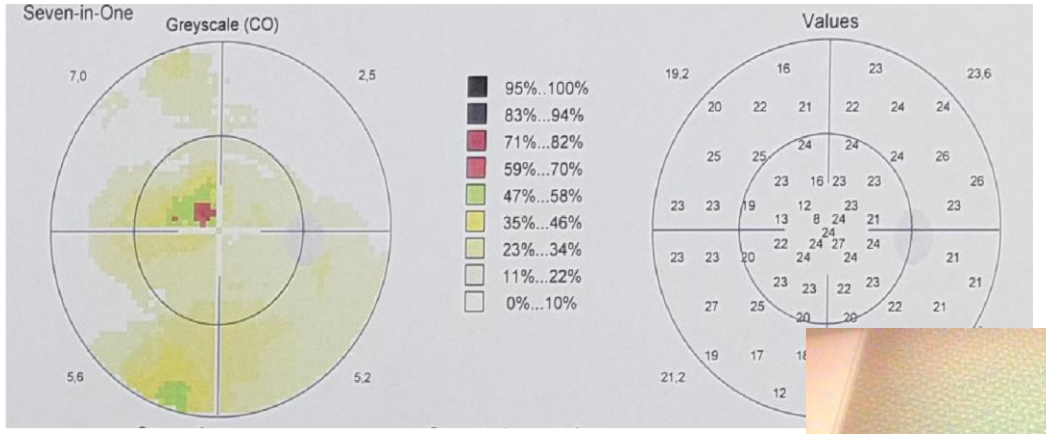




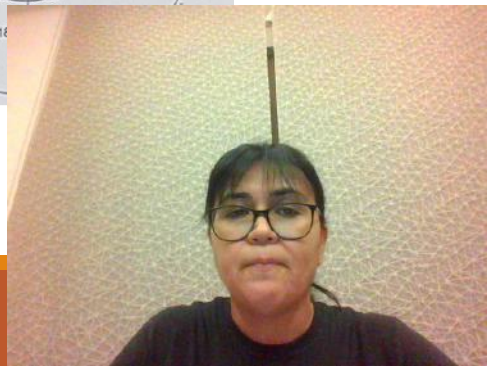


MfERG recording of a SMD patient before and 6 months after treatment





Visual field of the same SMD patient before and six months after treatment



CONCLUSION

Stem cell treatment with suprachoroidal implantation of MSC

seems to be safe and effective in the treatment of degenerative retinal diseases

in pediatric patients.

Further studies with large numbers and long term follow-up are needed in the future.

THANK YOU