

Artificial bruch's membrane implant: preliminary result on animal

Author: F. Patelli, MD, H. Quiroz-Mercado, MD, M. S. Blumenkranz, MD, R. Agurto-Rivera, MD, D. Yellachich, MD, F. Molnar, MD, T. Leng, MD, R. Dalal, MD, G. Alvarez-Rivera, MD

Purpose:

To describe surgical procedure of subretinal artificial Bruch's membrane implant and to evaluate its biocompatibility in pigs eyes.

Methods:

12 pigs eyes underwent subretinal artificial Bruch's membrane implant. After mechanical posterior vitreous detachment and vitrectomy, subretinal fluid was injected to create a retinal detachment. After retinotomy, artificial Bruch's membrane was positioned under the retina. Fluid-PFCL-silicone oil exchange was performed at the end of the procedure. Six eyes (group A) were enucleated 1 week after surgery while the other six eyes (group B) 1 month after surgery. All the eyes underwent clinical examination, OCT and histological evaluation of the membrane.

Results:

Surgical procedure was successful in all the eyes without complications. Clinical examination showed no sign of membrane rejection or immune reaction, and no visible granuloma was present in both groups. At the OCT examination artificial Bruch's membrane looks like an hyperreflective layer under the retina. No subretinal fluid or edema are present in both groups. The histological examination showed a normal retina over the membrane without signs of toxicity. No signs of immune reaction or granulomas were present. The histology also showed RPE cells growing in clumps over artificial membrane. This could support the hypothesis that artificial membrane can sustain cultured cells.

Conclusion:

No complications were observed during surgery. The artificial Bruch's membrane looks to be well tolerated and biocompatible. Further studies are needed to determine if this membrane could potentially be the structure to restore the original damaged Bruch's membrane to support the retinal pigment epithelium in eyes affected by ARMD.