

Retinal Complications After Lateral Rectus Transpositional Squint Surgeries: A Review of Literature

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Abstract

In oculomotor nerve palsy, four of the ocular muscles is affected and the eye is in hypotropia and abducted position. The goal of the squint surgery is to bring the eye in primary position. Supramaximal recession resection have been tried but of limited benefit. Transpositional squint surgeries have been described for the same to bring the eye in orthophoric position. These surgeries have been in practice since 1989 when it was first described by Taylor et al. Later on several modifications of this surgery was done by Kaufman et al (1992), Morad et al (2000), Graf M et al (2010), Abbas et al (2010), Gokyigit b et al(2013), Erbagci et al (2016) and Saxena et al (2016). Here we reviewed all the reported cases of lateral rectus transpositional squint surgeries done between 1989 and 2021, the reported retinal complications, their explanation and resolution. Pubmed library was used as a database.

Keywords: Transpositional Squint Surgeries, Third Nerve Palsy, Exudative Retinal Detachment.

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Introduction

Third nerve palsies are frequently encountered in clinical practice. Supramaximal recession and resection have been tried with limited benefit. Transpositional surgeries often achieve good surgical outcome.

Transpositional Surgeries and Their Various Modifications:

The first transpositional surgery was described by Taylor et al in 1989 in which they did medial transposition of LR in 1 case. In the second stage LR (lateral rectus) was recessed and resection of MR (medial rectus) was also done to bring the eye in orthophoric position. The second stage brought an improvement in the ocular motility and almost full adduction of ocular motility was achieved. They reported no complication of this procedure.^[1]

Kaufman et al in 1991 reported 2 cases in which the LR was split and the superior half was transposed in the retroequatorial region near superonasal vortex vein. Similarly the inferior half was transposed in the retroequatorial region near inferonasal vortex vein. They reported resolution of deviation and no retinal complication of this procedure.^[2]

Morad et al in 2000 reported 1 case in which they did medial transposition of LR and SO (superior oblique) tenectomy

combined with MR resection and achieved good resolution of symptoms. They did not report any retinal complication of this procedure.^[3]

M Graf et al (2010) reported 3 patients in which the LR muscle was transposed to the medial margin of MR passing between globe and IR and also behind the inferior oblique (IO) and achieved good correction of exotropia and vertical deviation. They did not report any retinal complications of this procedure.^[4]

Abbas Bagheri (2010) described a modification done in 10 patients in which the LR muscle was split, followed by disinsertion. The superior half was passed between SR and sclera and the inferior half was passed between IR and sclera. The MR was sutured as posteriorly as possible and cut. The distal stump of the MR was split into two halves and sutured with the superior and inferior halves of the LR. The proximal portion of the MR was sutured to its original insertion. No complication was reported in any of the 10 patients.^[5]

Gokyigit b et al. (2013) described a new modification in which the lateral rectus was split and the upper half was passed between SR and SO and the lower half was passed between IR and IO. The ends were attached 1mm posterior to the superior and inferior border of the MR. No retinal complications of this

procedure was reported.

Erbagci I (2016) described a new modification in which the lateral rectus was disinserted and split into two halves. The upper half was passed between the sclera and SR and the inferior half was passed between the sclera and IR. The two halves were sutured near the insertion of MR. No retinal complication was reported.^[6]

Soni et al (2017) reported central serous choroidopathy after the transposition surgery. They attributed this to the compression of the vortex veins. Over the years they developed various steps to reduce the tension over the split halves of the muscle and reduce the chances of this complication.^[7]

Saxena et al (2016) described a new modification in which medial transposition of the split lateral rectus was done by force augmentation through the use of fixation sutures placed at the equator. Out of three cases done by them, they did not report any retinal complication.^[8]

Yadav et al (2021) reported a case of exudative retinal and choroidal detachment after LR transposition. The choroidal and retinal detachment resolved only after releasing the sutures and giving topical, oral and intravenous steroids.^[9]

Shah et al (2014) reported choroidal detachment in one of the six patients of their case series of transposition surgeries. In this patient of choroidal detachment, they found that the lateral rectus was not split adequately posteriorly.

Discussion

Transpositional surgeries involves transposition of lateral rectus to the medial rectus region. Several modifications of this procedure have been described. However this procedure involves placement of the muscle to a position different from its anatomical location. Structures like vortex veins might be compressed by the transposed muscle. Vortex veins carry the choroidal venous outflow and compression of them can lead to venous overload choroidopathy. Due to overload and stasis, the chorio-capillaries leak fluid into the subretinal space and sub-pigment epithelial space causing retinal and choroidal detachment.^[10] Due to lack of lymphatics in the choroid, the fluid is absorbed very slowly unless the compression from the vortex vein is removed. Newer studies have shown that fluid from the choroidal space is removed mainly by choroid and its osmolarity and less likely by the RPE pump.^[11] Long term presence of subretinal and sub-pigment epithelial fluid can lead to photoreceptor atrophy and choroidal vascular remodelling.^[10]

Conclusion

Transpositional surgeries often achieve excellent correction not achieved by conventional recession-resection procedures.

However these procedures are less often associated with retinal complications like exudative retinal and choroidal detachment. Most of these detachments resolves on its own. However in non resolving cases, release of the sutures and steroids can lead to resolution of the symptoms.^[9] Long term exudative and choroidal detachment can lead to permanent changes in the retina and choroid and should be intervened.^[10]

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