
DIPLOPIA FOLLOWING CATARACT SURGERY -AN ENIGMA WARRANTING ATTENTION

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INTRODUCTION

The usual result a surgeon expects after removing the patch on the first post operative day after cataract surgery is a clear cornea, a quiet anterior chamber, a regular and round pupil and the dazzling IOL in the capsular bag. Patients with such ideal indices are expected to have a good visual acuity as well. It is quite perplexing for a surgeon if, and when a patient despite of having a good outcome ,complains of what has been described as one of the most morbid entities in ophthalmology practice, Diplopia. It is not very common in occurrence though, thankfully so, one must understand the causes why it develops, it's prevention and management .

CAUSES

Pre-existing Intermittent Exotropia

IXT when present before cataract starts developing, the patient has the ability to fuse. However, after cataract blurs the vision significantly, fusion breaks and the intermittency may worsen to result in constancy. After cataract surgery in these patients, sometimes they fail to employ their fusional ability to the fullest.¹ Since in IXT there is no foveal suppression, diplopia results.¹

Sensory Tropia

If a patient develops a sensory tropia due to the cataract being longstanding, and if the amount of deviation is large, they may fail to fuse in the post operative period.

Direct muscle injury during cataract surgery

Injury to EOM during cataract surgery is the most common cause of diplopia following it.² In the past, this has been attributed to various factors like damage from bridge

sutures, superior oblique palsy, aggravating thyroid ophthalmopathy and so forth. However, recently it has been realized that myotoxicity of the local anaesthetic solution is the principal factor responsible for such injury.^{2,3} Unlike the above two causes, this has a spectrum of clinical presentations depending on the muscle involved and the sequelae it undergoes after the initial insult. We will discuss this in detail.

PATHOPHYSIOLOGY OF MUSCLE INJURY

It was as early as 1991, when strabismologists began investigating strabismus occurring after cataract surgery. Von Noorden et al reported a series of 30 such cases wherein they blamed the local anaesthetic agent for causing paralysis of a vertical rectus.² They also noted a contracture of the ipsilateral antagonist coupled with it resulting in strabismus. Rainin et al in 1992 studied the effect of local anaesthetic agents on monkey and human muscles and extraocular tissues.³ They noted that injury to the tissue occurs only when the fluid is injected intramuscularly. Myotoxic effect of the same agent failed to manifest itself when the muscle is bathed in the solution. Thus it could be inadvertent penetration of the muscle sheath by the needle which is the sole determinant of this complication. This explains it's rare occurrence. However, when there is an injury, the course it follows is quite the same on most occasions.

First, the affected muscle is paretic. In most cases, the muscle involved is Inferior Rectus. It is associated with an overaction of the ipsilateral antagonist and there is a diplopia as early as the first post-operative day.⁶ With time, the injured muscle heals on it's own and diplopia resolves.⁴ Consequently, fibrosis involving a portion of the muscle

may ensue which produces the effect of a resection. Thus diplopia rebounds, this time in the opposite direction. If the fibrosis is extensive, the resultant strabismus may behave like a restrictive one.

CLINICAL PRESENTATION

Clinical presentation depends on the muscle involved. Injury to a horizontal rectus, though rare, may not produce diplopia unless extensive as fusional amplitude in the horizontal meridian is much more. Vertical rectus injury almost universally results in vertical diplopia. Since Inferior Rectus is the most common muscle involved,⁷ resultant strabismus is usually a hypertropia initially which reverses to a hypotropia after sometime. There may be a small V pattern as it is an adductor in downgaze.^{1,8} Extrorsion may also be noted in the deorsum-adducted position of that eye. A diplopia chart shows typical pattern suggestive of IR overaction. A forced duction test will be positive for elevation.

MANAGEMENT

Management of this entity is quite exclusively surgical unless the deviation is small enough to be corrected by prisms. Intermittent XT and sensory XT should be managed by conventional surgical techniques. As with all strabismus patients, the protocol should always be decided on an individual basis. In case of muscle fibrosis, the affected muscle is recessed and the amount of recession required is usually large. Therefore, it is always advisable to leave the muscle on an adjustable suture for better titration post-operatively.^{1,8}

CONCLUSION

Emergence of newer techniques of surgery have also brought about a change in the technique of anesthesia. Subtenon's, intracameral and topical methods of anesthesia can reduce a host of complications including

muscle injury. However, since it is not possible to carry out all the procedures under topical anesthesia, it is prudent that we develop awareness towards such rare entities which can bring about unfavorable outcomes from otherwise uncomplicated surgeries and can seriously dent patient satisfaction.

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