Management of Cyclodialysis Cleft

Rebika Dhiman, Amit Sobti, Sumeet Khandjuja, SP Garg

Glaucoma Services, Dr RP Center for Ophthalmic Sciences, All India Institute of Medical Sciences, New Delhi, India

Correspondence: Rebika Dhiman, Glaucoma Services, Dr RP Center for Ophthalmic Sciences, All India Institute of Medical Sciences, New Delhi, India, e-mail: drrebika@gmail.com

ABSTRACT

Cyclodialysis clefts are rare. The most common reason for presentation is blunt-ocular trauma followed by various iatrogenic interventions. Diagnosis is particularly challenging and various new non-invasive techniques have been described to facilitate this process, such as ultrasound biomicroscopy (UBM) and the anterior segment OCT (AS-OCT). The management of cyclodialysis clefts should be conservative initially followed by a variety of nonsurgical and surgical modalities to achieve closure.

Keywords: Cyclodialysis clefts, Causes, Treatment, Hypotony maculopathy, UBM.

INTRODUCTION

‘Cyclodialysis cleft’ term was first used by Heine in 1905, to describe the separation of the meridional ciliary muscle fibers from its attachment to the scleral spur and ciliary body band. It creates a direct communication between drainage of aqueous from the anterior chamber to the suprachoroidal space. There is also decreased aqueous humor production due to diminished blood supply to the ciliary body. The above two factors contribute to hypotony in the patients of cyclodialysis clefts. These patients usually present with corneal folds, shallow AC, cataract formation, optic disk edema, hypotensive maculopathy, choroidal effusion, retinal striae and choroidal folds resulting in severe visual loss. The magnitude of hypotony is not proportionate to the size of the cleft.

Cyclodialysis cleft can be traumatic, caused by contusion injuries, or iatrogenic, caused by anterior segment surgeries, like extracapsular cataract surgery, phacoemulsification, etc. Occasionally, there can be traumatic cyclodialysis cleft that remains dormant and is later potentially opened during anterior segment surgery leading to postoperative hypotony.

DIAGNOSIS

Accurate diagnosis and precise identification of the cyclodialysis cleft is necessary for appropriate management. In traumatic cases diagnosis can be difficult in early stages due to presence of hyphema, hypotony, hazy media or iris structure abnormalities. The investigations for the evaluation of the cyclodialysis cleft includes:

1. Slit lamp gonioscopy is useful in cases with the clear media. It shows a deep angle recess with a gap between the sclera and the ciliary body band.
2. Surgical gonioscopy with chamber deepening with OVDs is a useful method in cases of shallow AC that precludes proper angle visualization.
3. Ultrasound biomicroscopy (UBM) is a contact procedure used to identify and localize the cleft when direct visualization is difficult. The UBM transducer tip emits high frequency pulses and detects the reflection from the ocular tissue interfaces giving a detailed representation of the anterior chamber, angle and the ciliary body. It can accurately diagnose and delineate the cyclodialysis cleft.
4. Anterior segment optical coherence tomography (AS-OCT) is a noncontact procedure. The technique is accurate and reproducible allowing the visualization of the angle in great detail. It has a higher resolution than UBM.

MANAGEMENT

Spontaneous closure of cyclodialysis rarely occurs in smaller clefts. The eyes with persistent hypotonic retinopathy requires treatment to prevent permanent visual loss.

Medical therapy is the first line management in all the cases. It consists of topical cycloplegics (atropine sulphate 1%) twice daily for 6 to 8 weeks. If there is no response to medical therapy in first six weeks it is unlikely to be successful. Medical management can close small clefts by causing the relaxation of the ciliary muscle allowing apposition of the detached meridional ciliary muscle to the sclera. It has been suggested that the reduction of postoperative steroids may facilitate inflammatory adhesions of the cleft size.

Laser photoacoagulation can be delivered via transcorneal, transscleral route or by endophotocoagulator probe. It may be effective in small clefts.
Transcorneal Argon laser burns are applied using a goniocopy lens within the cleft site. More recently, the use of transscleral diode photocoagulation applied over the cleft site with a G probe has been described using double row of 1500 mW and 1500 ms has been reported. Transscleral Nd:YAG laser cyclophotocoagulation has also been reported. There is a single case reporting the use of endophotocoagulator probe as an external laser source through the Swan Jacob lens. There is a localized inflammatory response following laser that encourages closure.

Transconjunctival cyclodestructive procedures are another noninvasive procedure to achieve adhesion between the ciliary body and the sclera. There is a single case report by Crohn et al demonstrating the closure of the cleft by cryotherapy alone. Unlike diathermy it neither destroys nor thins the sclera. It is useful in those cases where cyclodialysis cannot be visualized because of shallow AC. A more recent development is to combine transconjunctival cryotherapy with the injection of gas into the vitreous cavity to achieve apposition by internal tamponade. The method involves the overlapping applications each with a duration of 30 seconds and a temperature of –85° over the affected area. It is also useful in smaller clefts.

Transscleral ciliochoroidal diathermy after creating a partial thickness scleral flap. This induces a localized thermal burn and a secondary inflammatory reaction. It carries the risk of scleral ectasia and damage to the lens.

Scleral buckling with cyclotherapy.

Surgical management is effective in moderate-to-large sized clefts and those small clefts where the above measures have failed. The main aim in the surgery is to achieve a good apposition between the sclera and the ciliary body.

Direct cycloplexy as described in early reports involved the creation of limbal based partial thickness scleral flap followed by a stab wound over the area of cyclodialysis to incarcerate iris followed by cryotherapy. Presently, this approach has been modified in a number of ways. The main modifications are the use of either full thickness scleral flap (Mackensen and Corydon technique), or a partial thickness flap (Naumann and Volcker technique). The ciliary body is fixated to the scleral spur by the interrupted sclera—ciliary muscle—sclera sutures. Another modification involves the use of retrievable suture passed radially through the cornea, ciliary body base and the perilimbal sclera (Mc Cannel technique). Another approach involves the use of ab externo suture using double armed 10-0 polypropylene. The suture is repeatedly passed through a paracentesis, opposite the cleft, until the whole of the cleft is apposed to the sclera. But in all these techniques there is a major risk of bleeding from the ciliary body.

**STEPS OF DIRECT CYCLOPEXY (FIGS 1 TO 9)**

Combined vitrectomy, cryotherapy, gas tamponade. The gas bubble and the scar induction by cryotherapy causes direct mechanical apposition of the detached ciliary body to scleral spur. But this type of surgery requires extensive surgical skill and manipulation of both posterior and anterior segment and longer recovery period.

Portney and Purcell proposed the idea of anterior buckling using a sicon rod under the partial thickness scleral flap.
The advantage of this technique is that the intraocular surgery is avoided.\textsuperscript{22}

There are some newer approaches in the management of cyclodialysis cleft. Mardelli et al reported two cases of cyclodialysis cleft with chronic hypotony with cataract and chronic hypotony manages with a PCIOL implantation in the ciliary sulcus.\textsuperscript{15} After the phacoemulsification, a large diameter 13.5 mm rigid PCIOL was inserted in the ciliary sulcus and rotated till the middle part of the proximal haptic faced the site of the cleft. The IOL haptics apply a directional force toward the sclera fostering the adherence of the ciliary body fibers to the scleral spur. However, there are long-term risks of haptic erosion, hemorrhage, pain and inflammation due to large IOL haptic. This may be a safe and effective procedure for small cyclodialysis clefts.
Another technique of phacoemulsification with capsular tension ring (CTR) insertion in the ciliary sulcus has been described in a case of 360° of cyclodialysis cleft. The detached ciliary body is tamponaded to the scleral spur by the 13 mm Morcher Type 1L CTR (Cionni with one eyelet). The CTR is implanted in the sulcus and sutured to the sclera with 10-0 prolene with atleast two points of suspension. One pass is made at the point of most severe dialysis. CTR placed in the bag may not be able to exert the direct tamponade force needed because the ring is tensile and the bag may limit the extent of the expansion of the CTR. The size of the CTR that corresponds to the diameter of 1 mm posterior to the surgical limbus is recommended by Yuen et al. This technique is useful for extensive cyclodialysis.

Direct cycloplexy under microendoscopic view can be done in aphakic eyes where an endoscope is passed via pars plana approach. In phakic patients there is a risk of lens touch and cataract.

Successful closure has been seen in more than 50% of the cases and is marked by a rise in IOP for variable periods postoperatively.

REFERENCES