



Dead bag syndrome: a suspicious bilateral case

Dead bag syndrome: um caso bilateral suspeito

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ABSTRACT

Dead bag syndrome is one of the recently described causes of late intraocular lens dislocation. Its etiology is not yet fully understood, but it is related to the reduction or disappearance of lens epithelial cells with subsequent disaggregation of the capsular tissue. This study describes a case of late intraocular lens dislocation with confirmed disappearance of lens epithelial cells through histopathology. The contralateral eye appears to show clinical features consistent with dead bag syndrome. The eye affected by intraocular lens dislocation was treated with vitrectomy, during which capsule material was collected for histology, the displaced lens was explanted, and a new lens was sutured to the sclera, achieving a final visual acuity of 20/25.

RESUMO

A *dead bag syndrome* é uma das causas de deslocamento tardio de lentes intraoculares recentemente descrita. Sua etiologia ainda não é totalmente conhecida, mas tem relação com a diminuição ou o desaparecimento das células epiteliais do saco capsular com a posterior desagregação do tecido capsular. O presente estudo descreve um caso de deslocamento tardio de lentes intraoculares com desaparecimento das células epiteliais do saco capsular comprovado por histopatologia. O olho contralateral parece ter características clínicas compatíveis com a *dead bag syndrome*. O olho afetado pela luxação da lente intraocular foi tratado com vitrectomia, durante a qual foi coletado material da cápsula para histologia, explante da lente deslocada e sutura escleral de nova lente, obtendo acuidade visual final de 20/25.

INTRODUCTION

Cataract surgery (CS) is the most common surgical procedure in many countries and, by the age of 75, more than half the population is affected by cataracts.⁽¹⁾ This number tends to grow even more considering the increase in life expectancy and the emergence of new intraocular lens (IOLs) that make it possible to expand the indication for refractive lens exchange. Late dislocation of IOLs occurs at an average of 10 years after CS, with a cumulative incidence of 0.5 to 3% of surgeries, on average, 6 to 12 years after surgery.⁽¹⁻⁷⁾ The main causes of this displacement are pseudoexfoliation, previous vitreoretinal surgery, uveitis, myopia, and trauma.^(1,4,8,9) However, there are cases of dislocated IOLs that do not fit into any of the above conditions because it has a diaphanous, floppy capsular bag which, due to its fragility, breaks, causing the dislocation. Samuel Masket has been observing these cases since the early 2000s and coined the term “dead bag syndrome” (DBS) to refer to them. The first publications analyzing samples of bags and IOLs histopathologically occurred in 2022.^(8,9) Analysis of capsular bags reveals the absence or marked reduction of LECs, splitting and delamination of the capsule, showing its fragility. These are more evident at the level of the zonule insertion, which in turn is intact.^(6,8,9) In the current literature, we were able to find only two case reports of suspected bilateral DBS, but in both there was no histological confirmation in either eye.^(10,11)

CASE REPORT

A 66-year-old man reported a sudden, painless decrease in visual acuity over the past 2 days. He denied any history of ocular trauma or pre-existing ocular disease. The patient had undergone bilateral phacoemulsification 15 years earlier at a university hospital. On examination, the right eye (RE) showed a single-piece IOL dislocated inferiorly with a haptic trapped in the capsular bag and the presence of vitreous in the anterior chamber, with no corneal touch. The capsular bag was completely transparent with a vertical linear rupture through which the IOL had moved (Figure 1). The left eye (LE) showed a 3-piece IOL in the capsular bag, which was almost completely transparent, with vitreous present in the anterior chamber inferiorly, but with no visualization of a capsular rupture (Figure 2). The fundoscopic examination was normal and the axial length was 23.97 mm. A posterior vitrectomy associated with explantation of the dislocated IOLs was performed, cutting the lens into half. A new hydrophobic +19.5 diopters Micropure lens (PhysIOL S.A., Belgium) was implanted with four-point scleral fixation using

Gore-Tex suture, according to the technique described by Shah.⁽¹²⁾ During surgery, a sample of the capsular bag was taken and sent to the pathology. The sample was centrifuged, and the material was stained with hematoxylin-eosin only. Microscopy showed only amorphous tissue from the capsular bag, no identifiable LECs were seen (Figure 3). Two months post-surgery, the eye is stable with a well-centered IOL and a best-corrected visual acuity of 20/25 (Figure 4).

The study was approved by the Research Ethics Committee CAEE: 86679224.0.0000.5344.

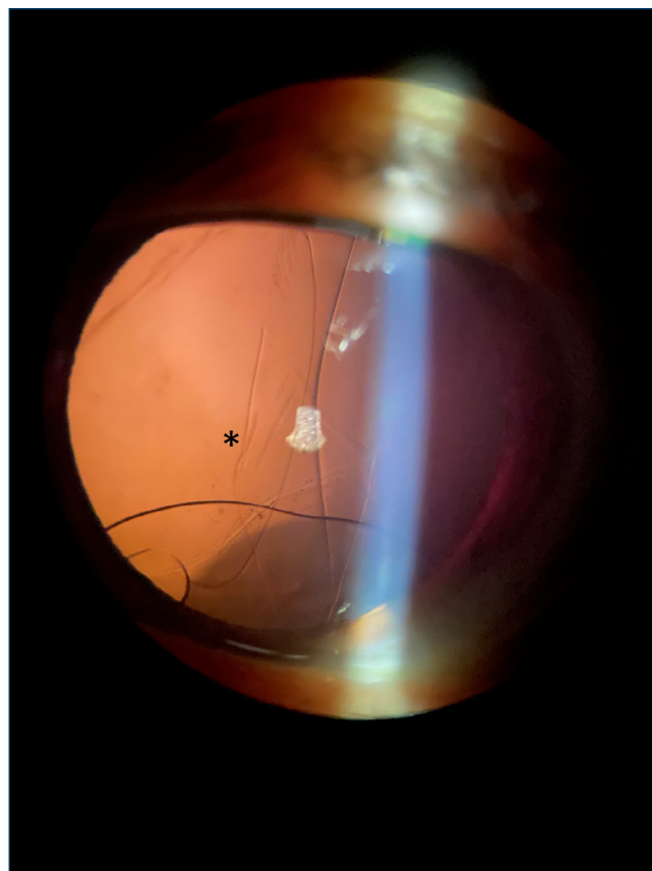


Figure 1. Right eye. Single piece of intraocular lens dislocated inferiorly with a vertical linear rupture (*) of the posterior capsule, which is completely transparent.

DISCUSSION

The exact pathogenesis of DBS is not yet fully understood. LECs are known to be fundamental in the production of type IV collagen, which constitutes the majority of the extracellular matrix that forms the capsular bag and thickens throughout life.⁽⁷⁾ This extracellular matrix is essential for the adhesion and migration of the LECs themselves.⁽³⁾ Following CS, an inflammatory process mediated by cytokines⁽²⁾ promotes the transformation of LECs into

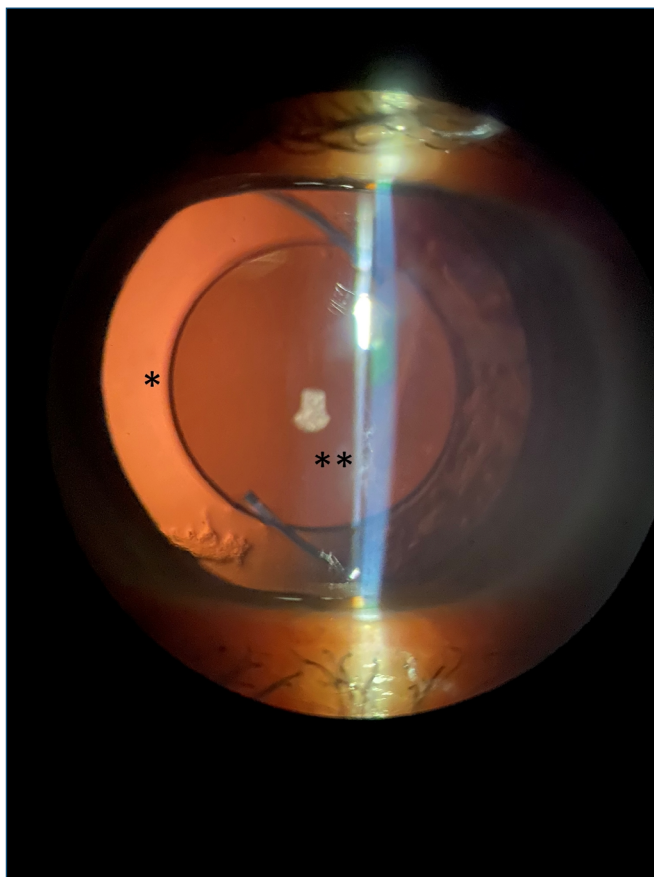


Figure 2. Left eye red reflex. Three pieces of intraocular lens with diaphanous bag (*) and vitreous in the anterior chamber (**) without evidence of capsular rupture.



Figure 3. Photomicrograph showing details of two histological slides. The sections of centrifuged tissue reveal exclusively acellular proteinaceous material (*).

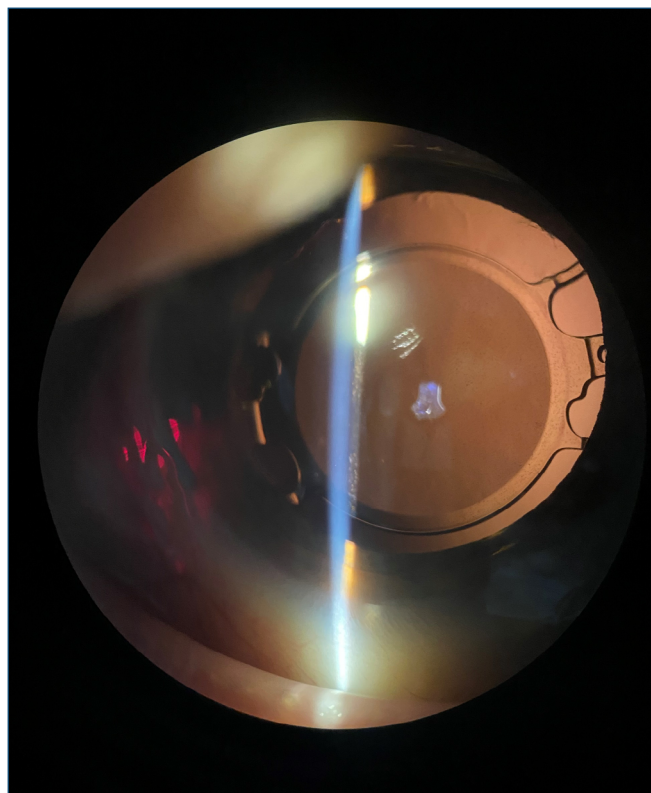


Figure 4. Right eye after surgery. The secondary implant of intraocular lens with four-point scleral fixation.

myofibroblasts, leading to shrink-wrap and stabilization of the IOL within the capsular bag.⁽⁷⁾ In DBS, the capsular bag remains open, and the IOL probably has space to move and rub against a fragile sac, eventually causing rupture and subsequent dislocation. While studies have tried to prevent and even eliminate the LEC-dependent reaction that causes opacification of the posterior capsule,⁽²⁾ with DBS we understand the fundamental role of these same cells in the integrity and maintenance of the capsular bag after CS. Eliminating LECs and the inflammatory process after surgery can prevent opacification of the posterior capsule but can also lead to loss of integrity of the capsular bag. In the reported case, the LE also appears to exhibit DBS, with a diaphanous capsular bag and vitreous in the anterior chamber, despite the lens being in the bag. The presence of IOLs with different characteristics (single piece RE and three pieces LE) indicates that DBS manifestation is independent of the type of lens^(8,9) and suggests a patient predisposition to developing the syndrome. It is possible that, in the future, the IOL in the LE may also dislocate, and it will be under observation.

Careful cleaning and polishing of the capsular bag is thought to be related to the genesis of DBS.^(4,8,9) The extent of capsular bag polishing performed during previous CS is unknown, and it cannot be presumed that this factor

contributed to the pathogenesis of DBS. We opted for vitrectomy with explantation of the IOL and subsequent fixation of a new IOL with a four-point Gore-Tex suture, due to the probable long-term stability of this surgical technique.

With the increase in population longevity and the broader and earlier indications for CS and phacorefractive surgery, it is likely that DBS will become increasingly common in the coming years. Understanding the underlying causes and identifying preventive strategies is essential to reduce the risk of late IOLs dislocation, particularly in younger patients. While excessive capsular polishing has not been definitively linked to this complication, exercising caution and avoiding overly aggressive polishing may be advisable. Compared to Nayak and Banerjee's bilateral cases, in which the diagnosis of bilateral DBS was based solely on clinical findings, this case includes histopathological confirmation in the RE.^(10,11)

AUTHORS'S CONTRIBUTION

Substantial contribution to conception and design: MCB, ACM, IRM, WLCS, AAH; Data acquisition: MCB, ACM, AAH; Data analysis and interpretation: MCB, ACM, IRM, WLCS, AAH; Manuscript drafting: MCB, ACM, IRM, WLCS; Critical review of the manuscript for important intellectual content: MCB, ACM, IRM, WLCS, AAH; Final approval of the submitted manuscript: MCB, ACM, IRM, WLCS, AAH; Supervision of administrative, technical, or

material support: ACM; Research group leadership: MCB, ACM.

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