for weeks, requiring the addition of topical corticosteroids and other adjunctive therapeutic agents to prevent severe corneal necrosis and perforation. Even in its response to treatment it can be said that a *Moraxella* corneal ulcer often appears to be down but it is never out. Once the diagnosis is confirmed with positive corneal scrapings and cultures, the truly difficult part begins: the battle to limit the necrosis of the corneal tissue that ultimately leads to scarring and visual disability. In this sense *Moraxella* can truly become the bug from hell.

My congratulations to Das *et al*[10] for providing in this issue of the *British Journal of Ophthalmology* (***see p 1236***) an excellent analysis of 95 cases of culture-proved *Moraxella* keratitis. The authors have shown that multiple local ocular risk factors predispose a person to *Moraxella* keratitis. This was the case in 78 of the 95 eyes (table 1 in Das *et al*[10]). Systemic risk factors such as diabetes, rheumatoid arthritis and leprosy were also mentioned in 13 patients (table 2 in Das *et al*[10]). It is of interest that terms such as alcoholic and derelict were not mentioned even once in this article as predisposing a person to *Moraxella* keratitis. This series of patients appears to finally put to rest the myth that *Moraxella* keratitis is a disease seen only in those who are alcoholic, derelict, or down and out. It is obvious from this excellent study that the organism is merely an opportunist looking for a compromised host, and its preferred host can be any cornea that is locally compromised for any number of reasons.

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Authors' affiliations
J P Whitcher, V Cevallos, Proctor Foundation, UCSF, San Francisco, California, USA

Correspondence to: J P Whitcher, Proctor Foundation, UCSF, 95 Kirkham Street, San Francisco, CA 94143-0944, USA; jack.whitcher@ucsf.edu

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ILM peeling

Relationship between macular hole size and the potential benefit of internal limiting membrane peeling

G A Williams

Macular hole size is a predictor for anatomical closure. Holes >400 μm in aperture size on an OCT scan are more likely to close when ILM is peeled

The development of surgical repair for macular hole surely ranks among the most important advances in vitreoretinal surgery over the past 15 years. Since the seminal report of Kelly and Wendel[1] in 1991, we have witnessed a remarkable evolution of surgical techniques, resulting in improved anatomical success, such that we can now confidently inform our patients that they have at least a 90% chance of anatomical closure of the macular hole. Despite this progress, two major challenges remain: firstly, to safely refine our surgical technique to allow anatomical closure of all holes and secondly, to improve the visual outcomes that all too often do not replicate the anatomical results. The resolution of these challenges constitutes the future of further advances in macular hole surgery. Various surgical techniques have been used to try to increase the rate of macular hole closure, including biological adjuncts such as serum, platelet extracts and growth factors.[2–4] More recently, surgical dissection of the internal limiting membrane (ILM) or ''ILM peeling'' has been introduced. The role of ILM peeling is now at the epicentre of the most important controversies in macular hole surgery.[5 6] Although several reports suggest that ILM peeling increases the rate of anatomical closure in selected patients, other reports disclose high closure rates without ILM peeling.[7–10] The mechanism by which ILM peeling facilitates macular hole closure is unknown, but may include the release of residual tangential traction on the edges of the macular hole or stimulation of a glial healing response. Some authors suggest that ILM peeling adversely affects visual outcome despite anatomical closure.[11 12] Others believe that ILM peeling may minimise or even eliminate the need for postoperative facedown (prone) positioning.[13] However, there is increasing evidence that the risks of ILM peeling are technique dependent. The use of indocyanine green (ICG) to stain the ILM has been reported to cause decreased vision and visual field defects.[14–17] Therefore, the issue is not only when but also how to peel the ILM. In this issue of the journal, Tadayoni *et al*[18] ***(see p 1239)*** provide information on the relationship between macular hole size as measured by ocular coherence tomography (OCT) and the benefits of ICG-assisted ILM peeling. As with previous reports, they found that hole size is a predictor for anatomical closure.[19 20] More importantly, they determined that holes >400 μm in ''aperture size'' on OCT were more likely to close when the ILM was peeled (73% closure without ILM peeling compared with 100% closure with ILM peeling). For macular holes <400 μm in size, there was 100% anatomical closure regardless of whether or not ILM peeling was carried out. The authors conclude that ILM peeling should be reserved for larger holes. This information is useful to

incorporate into the puzzle of ILM peeling, but important questions remain. For example, is this conclusion applicable if the ILM is peeled without ICG or with a different exposure (concentration, amount or time) to ICG? Is this conclusion applicable if postoperative positioning is different from the authors' technique? The answer to these questions is, of course, perhaps yes. A retrospective case series cannot be expected to provide definitive answers. However, the studies by Tadayoni *et al*[18] and by others on chronic macular holes in which chronicity may serve as a surrogate for hole size suggest that ILM peeling is beneficial in larger holes.[21] The advent of OCT has redefined our understanding of the pathogenesis and postoperative course of macular holes.[22 23] OCT provides precision in assessing the preoperative stage of the macular hole and assurance that the hole is closed postoperatively. Furthermore, preoperative and postoperative appearance on an OCT scan may correlate with visual outcomes.[23 24] However, OCT also has limitations. The horizontal resolution of OCT is about 30 μm, and precise imaging through the largest diameter of the macular hole is operator dependent. Therefore, the size of the macular hole as measured by OCT should not be considered absolute when measured close to the 400 μm cut-off for whether or not ILM peeling is advisable.

The second remaining major challenge in macular hole surgery is to improve visual outcomes in patients with successful anatomical closure. Again, Tadayoni *et al*[18] provide us with useful and somewhat comforting information that ICG-assisted ILM peeling as carried out in this study does not seem to have an adverse effect on visual function. They found no difference in visual improvement in eyes with closed macular holes with regard to whether or not ILM peeling was carried out. However, this study, like many other series on closure of macular holes, provides limited data on final visual acuity. We must remember that visual function is our primary goal, and not macular hole closure. It is therefore important to know how many eyes were able to see well enough to read, and what the effect of the surgery was on the patients' quality of life. To further improve visual function after macular hole surgery, we need to understand the mechanisms of visual loss that persist despite anatomical closure. Studies on experimental retinal detachment suggest that photoreceptor apoptosis may be operative.[25] If so, we must explore new concepts such as neuroprotection and photoreceptor rescue to improve visual function.[26] Perhaps, then, after macular hole surgery, we will consistently have a macula that sees as well as it looks.

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Correspondence to: G A Williams, 3535 W 13 Mile Road Ste 632, Royal Oak, MI 48073-6710, USA;
gwilliams@beaumont.edu

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