Late onset endophthalmitis associated with intraocular lens: a case of molecularly proved *S. epidermidis* aetiology

B Jansen, C Hartmann, F Schumacher-Perdreau, G Peters

Abstract

A case of severe endophthalmitis after cataract extraction followed by posterior chamber lens implantation is reported. Microbiological cultures from a tap of the patient's aqueous humour prior to lens explantation as well as from the explanted lens and aqueous and vitreous humour during operation yielded *Staphylococcus epidermidis* sensu stricto. Scanning electron microscopy showed massive colonisation of the lens loop by staphylococci. Clonal identity of all isolates was demonstrated by plasmid DNA analysis and sodium dodecyl sulphate-polyacrylamide gel electrophoresis (SDS-PAGE) of extracellular products. This is strongly suggestive of the aetiological role of *S. epidermidis* in this case of late onset endophthalmitis.

Coagulase-negative staphylococci – in particular *S. epidermidis* sensu stricto – are the commonest organisms isolated from foreign body infections. The pathogenesis of these infections is characterised by the ability of these bacteria to adhere to and grow on polymer surfaces and to produce an extracellular slime substance which protects the embedded bacterial cells against the host's immune response and antibiotic therapy. Moreover, *S. epidermidis* is regarded as one of the commonest micro-organisms isolated in late onset endophthalmitis. However, until now its aetiological role in these infections has not been proved, mainly because of the lack of an adequate animal model.

Here we report a clinical case in which a patient developed a recurrent endophthalmitis after intraocular lens implantation. The *S. epidermidis* strains isolated from the anterior chamber before surgery and isolates from the infected lens, aqueous humour, and anterior chamber after surgery showed clonal identity as determined by molecular methods.

Case report

An 81-year-old man underwent an extracapsular cataract extraction followed by posterior chamber lens implantation in July 1987 in another hospital. On the third day after operation inflammation of the eye with fibrin deposition and hypopyon were diagnosed. The posterior segment was also affected, showing massive vitreous infiltrates; in addition there was a transient corneal oedema. On treatment with steroids and antibiotics (substances and doses not known) all inflammatory signs slowly regressed. Nevertheless, there was continuous inflammation of the entire eye.

In January 1988 the patient was seen in our clinic with severe endophthalmitis and treated again with antibiotics (cefoxaxime 2 g three times a day, gentamicin 40 mg/40 mg/60 mg intra-muscularly per day), high doses of steroids (prednisolone 150 mg per day), and topical subconjunctival injections of steroids and antibiotics. Paracentesis of the anterior chamber was performed and the aqueous humour submitted for culture and microscopical examination, as inflammation with hypopyon and vitreous infiltration persisted. Two weeks later the intraocular lens was explanted together with the capsular bag, and vitrectomy was performed. The lens, aqueous humour, and vitreous humour were examined by microbiological methods. In the three months following the second operation the inflammation slowly regressed. The final visual acuity was 0.5 in comparison with light perception and intact light projection before surgery.

Microbiological cultures from a tap of the patient's aqueous humour prior to lens explantation as well as from the explanted lens and aqueous and vitreous humour during the operation all yielded coagulase-negative staphylococci.
Late onset endophthalmitis associated with intraocular lens: a case of molecularly proved S. epidermidis aetiology

Scanning electron micrography of the lens loop (Prolene) showed massive colonisation by staphylococcal cells (Fig 1). Identification by the method of Kloos and Schleifer⁴ showed in all four cases S. epidermidis sensu stricto. The antimicrobial resistance pattern was also identical for the four isolates, showing resistance of the strains to penicillin, ampicillin, cotrimoxazole, and tetracycline. To demonstrate identity at the molecular level sodium dodecyl sulphate-polyacrylamide gel electrophoresis (SDS-PAGE, Fig 2A), and analysis of plasmid profiles (Fig 2B) were performed, showing identical patterns for the four isolates with both methods.

Discussion

There are a number of reports of intraocular infections presumably caused by S. epidermidis after intraocular lens implantation following cataract surgery.⁴ In addition, the ability of S. epidermidis to adhere to and to colonise synthetic polymers has been demonstrated.⁷ Recently, it was also shown that S. epidermidis can adhere to intraocular lenses.⁸ However, it has not yet been proved that it can cause this type of infection, mainly because of the lack of an adequate animal model. Furthermore, coagulase-negative staphylococci are normal colonisers of skin and mucous membranes and often found as contaminants in clinical material. The clonal identity of coagulase-negative staphylococcal strains obtained from different sites (such as infected lens, aqueous humour, anterior chamber) and at repeated intervals has not been demonstrated in any of the studies published so far.

In the case presented here we isolated S. epidermidis from the explanted lens and demonstrated by scanning electron microscopy that staphylococcal cells were adherent to the lens loop embedded in a matrix of extracellular slime (Fig 1). All the S. epidermidis isolates cultivated from the lens, aqueous, and vitreous humour showed identity on the molecular level as shown by plasmid DNA analysis and SDS-PAGE. To our knowledge this is the first report in which the clonal identity of S. epidermidis obtained from different sites and at repeated intervals could be demonstrated in a patient with intraocular infection after lens implantation. The findings are strongly suggestive of the aetiologic role of S. epidermidis in this case of intraocular lens-associated late onset endophthalmitis. Thus this entity may be characterised as a chronic polymer-associated S. epidermidis infection.

Late onset endophthalmitis associated with intraocular lens: a case of molecularly proved S. epidermidis aetiology.
B. Jansen, C. Hartmann, F. Schumacher-Perdreau and G. Peters

Br J Ophthalmol 1991 75: 440-441
doi: 10.1136/bjo.75.7.440

Updated information and services can be found at:
http://bjo.bmj.com/content/75/7/440

These include:

Email alerting service
Receive free email alerts when new articles cite this article. Sign up in the box at the top right corner of the online article.

Notes

To request permissions go to:
http://group.bmj.com/group/rights-licensing/permissions

To order reprints go to:
http://journals.bmj.com/cgi/reprintform

To subscribe to BMJ go to:
http://group.bmj.com/subscribe/