About Adenovirus Ocular Surface Infections

Of the many adenovirus serotypes (at present more than 50) some cause human disease mainly involving the eye and the respiratory, gastrointestinal, and urinary tracts. Adenovirus eye infections, occurring either per se or in combination with general symptoms, are very common. The eye symptoms vary widely, ranging between a mild conjunctivitis and a severe keratoconjunctivitis leaving conjunctival scarring and disabling corneal opacities which persist for months, years, and even indefinitely. There is no curative treatment available.

The eye symptoms start with irritation, foreign body sensation, photophobia, and tearing in one eye; usually, within a few days, also the fellow eye becomes affected but less severely. Depending on the time elapsed between symptom onset and presentation, the eye findings may thus be uni- or bilateral and consist of some or all features such as: preauricular adenopathy; lid swelling with or without erythema; watery and mucoid discharge; conjunctival follicular hyperplasia, injection, chemosis, pseudomembranes, and haemorrhages; epithelial keratitis; folds of the Descemet’s membrane; and anterior uveitis.

The diagnosis might be easy but also extremely difficult and there are many fallacies, for example follicular conjunctivitis clinically indistinguishable from primary herpes simplex virus infections; severe lid swelling and erythema mimicking orbital cellulitis; allergic reactions; chlamydia infections; and idiopathic anterior uveitis.

Clinically, the various serotypes cannot be distinguished from each other although a follicular conjunctivitis in combination with general symptoms such as fever and sore throat (pharyngoconjunctival fever) may be suspected to be caused by types 3, 4, or 7. A missed diagnosis may have serious consequences – a nosocomial transmission of epidemic keratoconjunctivitis (EKC). EKC may be caused by several serotypes, but the classic cause of nosocomial infections is adenovirus type 8 (Ad8); types 19 and 37 are less common. In EKC, it is the initial stage of the infection that is particularly dangerous, not only because it is highly contagious but also because often the infection is not suspected. And a special problem, before an outbreak is discovered, are patients in whom the infection is superimposed on their preexisting diseases (Chap. 2).

The first nosocomial outbreak of Ad8 EKC I had the doubtful pleasure to witness occurred when I was working in the Emergency Department of the Eye Clinic. One morning, pondering over a patient with a severe keratoconjunctivitis I just had seen, I went to ask my colleagues about similar cases and the first one I met gave me an affirmative answer: Also he had just seen one. Our suspicion, sadly enough, did not result in false alarm – a large outbreak was already a fact; the ward section had to be closed down, operations stopped, and the outpatient clinics reduced to a minimum.

Some 15 years later, the outbreak happily forgotten, a similar event occurred. The suspicion arose while seeing a patient who had visited the Clinic a couple days before and now presented with a keratoconjunctivitis. At the same time, a younger colleague came to ask me to see a patient with a peculiar anterior uveitis – and the situation was clear. It was too late to avoid an outbreak, but this time it was stopped by simple precautions. Altogether, there were 33 diagnosed cases of which 23 by nosocomial transmission, mainly via fingers and a multidose bottle of eye drops used for tonometry. The outbreak was caused by Ad8.
The next occasion was a year later, but with the last outbreak fresh in mind there was only one secondary case. Also that time, the cause was Ad8. In countries like Sweden, in which Ad8 is not endemic, the danger of an imported infection is often underestimated. Some years after the last occasion, I felt rather uncomfortable when I saw that my next patient was a Japanese gentleman who had left home with a red eye, visited the Clinic the evening before because of worsening of symptoms, and was examined by a junior staff member who failed to suspect the infection. The cause was, again, Ad8. I would like to believe that preventive measures were still working, but it might have been pure luck that at that occasion the Clinic escaped a new outbreak of EKC.