A 32-year-old health worker presented to the emergency department with a three-day history of headache, left eye pain, fevers and rigors. There was no eye swelling or change in vision and no associated rash. Her past medical history included only asthma and a previous tonsillectomy.

On examination she was tachycardic (heart rate 116bpm), hypotensive (blood pressure 88/50mmHg) and febrile (40°C). The external upper and lower eyelids appeared erythematous bilaterally. The upper lids were everted and diffuse follicular conjunctivitis was seen in both eyes (Figure 1A). The bulbar conjunctivae were injected bilaterally but not chemotic. The anterior chambers were quiet and both corneas were clear without fluorescein uptake. There was overt painless cervical lymphadenopathy in the anterior and posterior triangles of the neck. She was photophobic without evidence of neck stiffness and the remainder of the neurological examination was normal. Examination of the cardiovascular, respiratory and gastrointestinal systems was otherwise unremarkable.

Empiric antibiotics for the possibility of meningitis were administered in conjunction with intravenous fluids. Initial investigations revealed a normal haemoglobin and white cell count with a mild thrombocytopenia (platelets 134x10⁹/L). The urea and electrolytes were normal, however the CRP was elevated (115mg/L). Blood cultures were negative. Her CSF had a white cell count of 2x10⁶/L, normal protein and glucose, negative gram stain and no subsequent growth from bacterial culture. There was serological evidence of prior exposure to EBV but not to CMV or toxoplasma.

CT imaging of the head and neck demonstrated low-grade pan-sinusitis of the paranasal sinuses, marked thickening of the soft palate and uvula, and extensive cervical adenopathy extending from the skull base to the thoracic inlet involving both anterior and posterior chains bilaterally (Figure 2). There was minimal periorbital oedema.

On Day 2 she briefly developed a blanching macular exanthem on her abdomen and thighs (Figure 1B), which spontaneously resolved.

Respiratory multiplex PCR (Fast Track Diagnostics Respiratory Pathogens 21) of a nasopharyngeal swab was positive for adenovirus. This was also detected on specific adenovirus PCR from a swab of the

Figure 1A: Bilateral diffuse follicular conjunctivitis present on admission.
**Figure 1B**: A blanching macular exanthema developed on day 2.

**Figure 2**: A transverse CT section of the neck demonstrates enlarged lymph nodes (arrows).
left eye. Subsequent typing completed by
the Institute of Environmental Science and
Research (ESR) New Zealand using PCR and
sequencing techniques revealed this to be
adenovirus type 4.1

Over the next several days she continued
to improve clinically and was discharged
with GP follow-up to ensure resolution
of lymphadenopathy. She was stood
down from work until her symptoms had
completely resolved.

Discussion

Pharyngoconjunctival fever is a constel-
lation of febrile pharyngitis, benign
follicular conjunctivitis and cervical
adenitis. Given its highly infectious nature
and many well-described outbreaks, the
recognition of its clinical features has
important public health implications.

Worldwide, adenovirus is becoming
increasingly prevalent and is sometimes
associated with severe morbidity and
mortality, particularly in those aged under
18 years.2 Adenovirus can be responsible
for infections arising in the respiratory
tract (most commonly), gastrointestinal
system, urinary tract and eyes. The clinical
features of pharyngeal infection (high
fever, exudative tonsillitis, leucocytosis and
elevated CRP) may mimic severe bacterial
infections such as those caused by Group A
Streptococci.3 Occasionally adenovirus can
cause pharyngoconjunctival fever, which
occurs mainly in children. Pharyngocon-
junctival fever can be caused by multiple
subtypes of adenovirus, but adenovirus
types 3 and 7 are the most common.4
This clinical syndrome is most frequently
described in outbreaks within schools,
school camps and swimming pools; an
outbreak in a swimming pool in Spain in
2008 was attributed to adenovirus type 4.5

Pharyngoconjunctival fever outbreaks are more often reported in Australia, the
US and China, particularly in the summer
months.6 We are not aware of any literature
describing an outbreak of pharyngocon-
junctival fever in New Zealand. However,
in line with global epidemiological trends
adenovirus is also becoming more common
in New Zealand with 1,802 cases reported in
2015 compared to only 842 cases in 2014.7
The predominant serotype isolated in 2015
was type 7 (61%), followed by type 3 (10%)
and of those whose clinical details are
available, the majority presented with respir-
atory symptoms, with 50 patients admitted
to hospital (including nine requiring ICU)
and two deaths.7

Adenovirus is highly contagious and
can be transmitted via droplet, faecal-oral
and contact routes. It is able to survive
long periods on environmental surfaces,
which increases transmission risk. Medical
practices and hospitals, in particular eye
outpatient clinics, should be considered as
potential sources of transmission. Currently
there are no approved antiviral agents for
the treatment of adenovirus infections,
and in this patient group treatment is
supportive. However, in those with severe
disease, particularly in the setting of immu-

nocompromise, cidofovir (a nucleoside DNA
polymerase inhibitor which has activity
against adenovirus) may be tried.8 Of note,
this is an unapproved medication available
under Section 29 of the Medicines Act 1981.

Due to the morbidity associated with
respiratory adenovirus infections in military
recruits, successful live oral vaccines for
adenovirus types 4 and 7 were developed
and began being administered in 1971. The
vaccine is currently only available to the US
military after large outbreaks caused hospi-

talisations and fatalities.8,9

Given the potential associated morbidity
and mortality, it is important to identify
cases of adenoviral infection early and
emphasise diligent infection prevention
and control practises to reduce the trans-
mision of this virus and the potential for
an outbreak.
Competing interests:
Nil.

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