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Further investigations revealed a normal computed tomography scan of the brain; however, a magnetic resonance image of the brain revealed cortical atrophy that was not in keeping with his age. An electroencephalogram showed a background of slowing and of low-amplitude (4 Hz) wave activity, but no focal or epileptiform activity. Nerve conduction studies confirmed a sensory-motor neuropathy. A videofluoroscopic study (modified barium swallow), done to assess the extent of his pseudobulbar palsy, revealed a delay in the triggering of the swallowing reflex. He has regained minimal motor and sensory function, and receives regular physio- and occupational therapy as part of his continued rehabilitation. He awaits a percutaneous gastrotomy to assist with appropriate feeding.

**Discussion**

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unintentional injuries worldwide.1,10 Africa has the highest incidence of fatal poisonings worldwide, at 4 per 100 000.11 Poisoning with podophyllin is rare, with most cases documented around the 1970s - 1980s. The drug is widely used for the treatment of genital warts. The last known reported case was a paediatric patient in India in 2001.12 There are very few reports on the toxic effects of this compound, and therefore the serious systemic and neurological effects of podophyllin are not fully appreciated.

Podophyllin use began in the 1800s, variously as an emetic and cathartic agent to an antivenom and suicidal agent.13,14 Later, its use was extended as a local agent for skin lesions.15 The widespread use of podophyllin for condyloma acuminatum only began in 1942.15 The first documented side-effects were reported around 1835, when a woman developed abdominal cramps and pain after ingestion,13 and the first fatal case after oral administration was reported in 1890. A fatal case relating to topical application was reported in 1954.16 The active constituent of the drug is podophyllotoxin, a lipid-soluble compound extracted from the resin of Podophyllum plant roots, which readily crosses cell membranes.17,18 Podophyllotoxin is a cytotoxic agent that inhibits DNA synthesis as well as cell mitosis in metaphase.

Podophyllin has both local and systemic effects associated with topical and oral use. It is a severe irritant to mucous membranes, with local effects including erythematous, oedematous and ulcerative skin lesions, burns and conjunctivitis.19,20 Systemic toxicity causes multiorgan dysfunction. Gastrointestinal irritation in the form of nausea, vomiting, abdominal pain and diarrhoea, and bone marrow suppression with thrombocytopenia and leucopenia, manifest early in the presentation. Renal and hepatic failure with electrolyte disturbances, including hypokalaemia and hypoglycaemia, have been noted in several cases.20,21 Neurotoxicity is the most severe effect of podophyllin poisoning.2,22 Initially, the presentation includes altered sensorium ranging from confusion to coma, but may include hallucinations, stupor, seizures and ultimately death.22,23 Peripheral neuropathies can appear early, but mostly present some days later with motor (hypotonia, hyporeflexia) and sensory (paraesthesia, glove and stocking loss of light touch and proprioception) deficits.22,24 Autonomic neuropathies can also be present, manifesting as paralytic ileus, hypotension, tachycardia, urinary retention and anorexia.2,25 Our patient had complications of bone marrow suppression, renal and hepatic impairment, as well as peripheral and autonomic neuropathies.

The management of podophyllin ingestion and subsequent toxicity is mainly supportive, as no specific antidote exists. Activated charcoal is recommended for use after a recent ingestion.2,22 Adequate management of ventilation and circulation is required, accompanied by monitoring for the abovementioned complications. Haemoperfusion to reduce plasma levels of podophyllin has been reported in the literature; however, its use has only been reported in adults and its effect on outcomes remains unclear.21

In South Africa, Malangu et al.17 reported that 17% of total paediatric ward admissions are due to acute poisoning, with the majority being unintentional poisonings and with children <10 years of age comprising 80% of all poisoning victims. Podophyllin is still a widely used treatment, especially as a topical application. Despite podophyllin poisoning being rare, with few reported cases, the toxic side-effects (especially the neurotoxicity) must be highlighted because of the associated morbidity and mortality.21

Accidental poisoning in children, as in this case, is a preventable injury. Education of parents and healthcare workers on home safety still remains the mainstay of prevention. Most poisoning cases require supportive management, and poison control centres should be contacted early for management guidelines.

Ethical approval
Informed consent for the publication of this case report was obtained from the mother of the child.

References