Airway complication associated with injection of phosphatidylcholine and deoxycholic acid into the neck: a case report

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Introduction

The practice of delivering cosmetic injectables in the outpatient setting continues to grow in Australia.1 The increase in demand has seen a dramatic rise in the number of new cosmetic injectable clinics using telehealth prescribing services. Lipodissolve treatment is an example of a non-surgical procedure that aims to improve the appearance of a ‘double chin’ by injection of phosphatidylcholine (PC) and deoxycholic acid (DCA) into submental adipose tissue. We describe a case of an airway complication and hospitalisation secondary to the injection of Lipodissolve in the neck of a 23-year-old female.

Keywords: phosphatidylcholines, deoxycholic acid, adipose tissue

Case report

A 23-year-old normally fit and healthy female presented to the emergency department with an acute presentation of dysphagia, odynophagia and orthopnoea 24 hours after receiving multiple injections of Lipodissolve into the submental region of the neck. The injections were administered by a registered nurse at a cosmetic clinic following video consultation with an interstate medical practitioner. Physical examination demonstrated restricted neck movements with oedema and bruising along the anterior and lateral neck.

Flexible nasoendoscopy (FNE) revealed marked oedema of the right lateral pharyngeal wall and aryepiglottic fold causing narrowing of the laryngeal airway (Figure 1a and b). Imaging
with computed tomography (CT) showed hypoattenuation involving the pharyngeal mucosa extending from the pre-epiglottic fat to the aryepiglottic fold, with axial maximal dimensions of 17 × 21 mm and non-specific diffuse subcutaneous fat stranding involving the anterior cervical neck (Figure 2a and b). Additionally, there was a small collection at the posteroinferior margin of the right submandibular gland (Figure 2c). The patient required initial monitoring in the intensive care unit followed by inpatient observation for six days before discharge home. She was treated with piperacillin and tazobactam due to febrile episodes and high inflammatory markers (elevated white cell count [neutrophilia] and C-reactive protein). She returned to the outpatient clinic two weeks after discharge with a fibrous subcutaneous lump over her submental region but had an otherwise normal endoscopic examination of the larynx.

**Discussion**

Lipodissolve is an injectable preparation consisting of PC (10.0%) and DCA (8.4%). Deoxycholic acid is a bile salt that is used as a biological laboratory detergent. When used in isolation, it is registered under the propriety name Belkyra® (Allergan Australia Pty Ltd, 810 Pacific Highway, Gordon NSW 2072 Australia) on the Australian Register of Therapeutic Goods (ARTG). Belkyra was approved in 2016 by the Therapeutic Goods Administration (TGA) for the specific indication of treating ‘the appearance of moderate to severe fullness associated with submental fat in adults’.  

Deoxycholic acid induces lipolysis in a non-specific fashion through vacuolisation of adipocytes and creates an inflammatory response within the septa and lobules of the subcutaneous fat, resulting in fat necrosis.
Phosphatidylcholine is listed as a complementary medicine on the ARTG as an oral liquid.\textsuperscript{4} When DCA is compounded with PPC, it is administered under the name Lipodissolve—this is not a TGA-approved chemical entity. Phosphatidylcholine is a phospholipid, a major component of cell membranes and pulmonary surfactant. The mechanism of PC is not well understood, with various theories suggesting that it acts as an emulsifying agent and accelerates fat elimination through the gastrointestinal and urinary systems.\textsuperscript{5,6} Various clinical trials have demonstrated the local side effects of DCA and PC.\textsuperscript{7} These include injection-site pain, inflammatory changes (such as ulceration, oedema, erythema, ecchymosis, paraesthesia and dysphagia) and the occurrence of subcutaneous nodules post-treatment.\textsuperscript{8} Reported systemic side effects including diarrhoea, steatorrhoea and abdominal pain are thought to be secondary to faecal elimination of DCA.

There has been one case report of a submental abscess secondary to DCA use, requiring intravenous antibiotics and a subsequent incision and drainage.\textsuperscript{9} Oedema of the supraglottic airway and deep neck space fluid collections have not been recorded as known complications.

Given the complexity of head and neck anatomy, a thorough understanding of surface anatomy, deep neck spaces and vital structures is essential to avoid serious complications. In this case, a 30-gauge 1.9 cm long needle was used to inject Lipodissolve. The injection probably passed through skin and subcutaneous tissue into the pre-epiglottic or paraglottic space, causing partial obstruction of the laryngeal inlet. Ultrasonographic studies of cervical soft-tissue thickness have shown the distance from the skin through the pre-epiglottic space to the epiglottis to be 1–2.5 cm in healthy individuals. Accordingly, injection in the axial plane through skin below the hyoid risks entering the pre-epiglottic or paraglottic space within only 1 cm of injection depth.\textsuperscript{10} Injection at the same entry point in an angled plane (upwards) towards the submental space would avoid this serious complication in the pre-platysmal fat pad.

The practice of delivering cosmetic injectables is on the increase with more patients opting for non-surgical procedures in aesthetic clinics that provide telehealth prescribing services.\textsuperscript{1} The rapid recovery, cost, accessibility and promotion through social media have caused a dramatic increase in the demand for cosmetic injectable clinics throughout Australia. In the 2016 Australian Public Assessment Report (PAR) assessing DCA, the advisory committee for the TGA noted

\textit{‘the use of deoxycholic acid should be limited to practitioners with experience in head and neck surgery (for example, head and neck surgeons [otolaryngologists] and plastic surgeons).’}

The advisory committee further noted ‘the incidence of adverse events could increase if unrestricted use of deoxycholic acid was permitted’ and ‘advised against administration by nurses or other health practitioners’.\textsuperscript{2} The TGA evaluator subsequently approved DCA on 19 July 2016 to be administered by ‘physicians, nurse practitioners, or any other person who is legally qualified to administer a prescription drug product in Australia’.\textsuperscript{2}

**Conclusion**

Accredited practitioners injecting Lipodissolve should be aware of the potential for airway complications when performing neck injectables. We have highlighted and demonstrated the potential for harm with injection of Lipodissolve into the neck, which in this case resulted in a deep neck space collection, airway narrowing and the need for antibiotics and hospitalisation.

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**References**

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