Aluminium chloride solution

Dear Editor

Thank you for the article about treatment options for nonmelanoma skin cancers (*AFP* July 2012).[1] I was particularly interested in the use of topical aluminium chloride 20% to produce haemostasis after a shave biopsy.

Aluminium chloride hexahydrate is a powder, soluble in water or alcohol, which has been used as a topical chemical coagulant for many years. It acts as a protein precipitant, which seals small blood vessels.

I also routinely use topical aluminium 20% (eg. Driclor™) as a cheap, simple and effective topical haemostatic agent. I apply it directly onto the bleeding dermis of the shave biopsy site with a cotton-tipped applicator dipped into the solution. Dental practitioners also use a topical aluminium chloride solution, paste or impregnated cord in order to control gingival bleeding.

But there are hazards and problems with using topical aluminium 20% for this purpose, which relate to its flammability, approved use and toxicity.

The 20% w/w solution of aluminium chloride hexahydrate contained in Driclor™ is dissolved in 70% ethanol and is therefore highly flammable. Cotton gauze, paper drapes and patient body hair can serve as added fuel sources that can ignite in the presence of oxygen and an ignition source such a spark from the active treatment electrode of an electrosurgical device.[2] Hence concomitant use of Driclor™ with electrosurgery (electrofulguration, electrodesiccation or electrocoagulation) is clearly contraindicated.

I am aware of a recent incident during which a shave biopsy was performed on a lesion on the nose of a patient taking warfarin. Topical Driclor™ and pressure was insufficient to control the bleeding. A short burst of electrofulguration was applied to the bleeding biopsy site. The electrode spark ignited damp cotton gauze containing Driclor™ that had been left in the operative field and a surgical fire ensued with resultant superficial burns to the patient's face.

This situation has been simulated in an experiment published recently, in which even aqueous aluminium chloride solution 35% was shown to be flammable.[3]

In addition, aluminium chloride hexahydrate has been shown to impair epithelialisation and wound healing.[4]

Driclor™ is only marketed and approved by the Therapeutic Goods Administration (TGA) in Australia for use as an anti-perspirant, and using it as in other ways must therefore be regarded as 'off-label' use.

Clearly, using aluminium chloride solution for haemostasis after shave biopsies is less than perfect, and has led me to question my use of this product and look for an alternative safer topical haemostatic agent for use in skin surgery.

Tranexamic acid is marketed in Australia as an antifibrinolytic agent. The oral formulation is approved for use in patients with coagulopathies undergoing minor surgery. Intravenous dosing is used during joint replacement surgery and cardiac surgery. It is contraindicated in those with a risk of venous thrombo-embolism.[5] Tranexamic acid has been used topically to control bleeding after oral surgery in patients taking anticoagulants and antiplatelet agents.[6]

A 500 mg tablet of tranexamic acid can be dispersed in 10 mL of water, and the resultant 5% solution is a very effective and nonflammable topical haemostatic agent.[7,8]

Whilst such topical use of tranexamic acid must still be viewed as off-label, this drug is TGA approved as an antifibrinolytic agent for the reduction of peri- and postoperative blood loss, and may have a useful role in skin surgery. There is a need for specific randomised controlled trials looking at the use of topical tranexamic acid in dermatological surgery.

Dr Graeme Siggs
Glenunga, SA

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Reply

Dear Editor

Thank you to Dr Siggs for the very detailed information on aluminium chloride and tranexamic acid.

Practitioners need to be aware of the flammability of aluminium chloride solution (and any other preparations used), and to have specific protocols to avoid burns, especially when diathermy/hyfraecation is used. I should have highlighted the risk of burns in the article. In my case, I do not use an electrosurgical unit if I use aluminium chloride solution. If the bleeding is significant enough not to stop with a combination of aluminium chloride solution, pressure and an alginate dressing, I will suture the bleeding vessel.

I could not find any specific reference to toxicity of aluminium chloride in relation to topical use, but it is certainly an irritant and probably impairs wound healing.[1]

Aluminium chloride solution is readily available, cheap and works well, but it would certainly be an improvement if an alternative agent could be used that had these attributes, and promoted healing. Tranexamic acid may well be such an agent[2] and I shall be trialling this with the help of the local university.

Dr Philip Clarke
Launceston, Tas

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Nocturia

Dear Editor

The authors of the article 'Nocturia – a guide to assessment and management' (*AFP* June 2012)[1] do not seem to understand the difference between nocturia and nocturnal frequency – there is a difference and it is most important. Nocturia is passing large volumes of urine at night. Nocturnal frequency is passing small volumes of urine at night – frequently (eg. prostatic hyperplasia causes nocturnal frequency not nocturia). Could they please comment?

A/Prof Robert McRitchie
Flinders University

Reference

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Reply

Dear Editor

We thank A/Prof McRitchie for reading our article and for his letter. However, we cannot agree with his assertion that 'nocturia is passing large volumes of urine at night' and 'nocturnal frequency is passing small volume of urine at night – frequently'.

Nocturia is defined as 'waking at night one or more times to void'.[1] This is irrespective of the volume of urine voided and this term can be applied to patients who wake to pass small or large quantities of urine. 'Passing large volumes of urine at night' implies nocturnal polyuria, a subtype of nocturia, which occurs when an increased proportion of the 24 hour urine volume occurs at night. A/Prof McRitchie refers to 'nocturnal frequency', or 'night time frequency', which is an uncommonly used term. 'Night time frequency' is defined as 'the number of voids that occur when the patient has gone to bed, but is yet to fall asleep and voids that occur in the early morning that prevent the individual from going back to sleep as he/she wishes'.[1] As such, night time frequency can also be applied to patients with small or large volume voids and is not specific to a particular aetiology.

Benign prostatic hyperplasia (BPH) can cause both nocturia and nocturnal frequency. Typically, BPH causes nocturia with small, frequent voids. However, it is a common misconception that prostatic disease is the only cause of nocturia in men and bladder pathology, for instance, can cause a similar pattern of small, frequent voids. Additionally, patients with BPH often have multiple contributing causes for their nocturia.[2,3]

We agree that it is essential to differentiate large volume nocturnal voids from frequent small nocturnal volume voids. This is why our article presents a classification system for nocturia into three categories based on the frequency/volume chart: global polyuria (increased total urine production), nocturnal polyuria (increased urine production at night) and frequent small volume voids with/without other lower urinary tract symptoms. Given the wide range of possible aetiologies for nocturia this division is necessary as management varies based on the subtype of nocturia and hence the frequency/volume chart is central to the assessment of the patient with nocturia.

Mr David Prince
Dr Kesley Pedler
A/Prof Prem Rashid

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