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Short Communication

Concern about ischaemia drives a persistent and generation-spanning aversion to adrenaline in digital anaesthesia

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The aversion to adrenaline-containing local anaesthetic (ACL) in digital blocks has been persistent, however there now seems to be an increasingly wider (although by no means universal) acceptance of the safety of ACL in hand surgery. There is certainly a demonstrable increase in interest in the topic: there has been a trend reflecting over 150% increases in both publications on the MEDLINE database, and in frequency of searches on Google for terms relating to ACL in digital surgery and Wide Awake Local Anaesthetic No Tourniquet (WALANT) over the past five years. The practice has been shown to be entirely safe in both laboratory and clinical studies.^{1,2} It has even been reported in national press as a topic of interest in relation to the COVID-19 pandemic, as a technique for reducing reliance of general anaesthesia.³ In our own unit, we believe ACL and WALANT to be of potential benefit to many patients and that an unfounded surgical dogma may be causing detriment to what could be a

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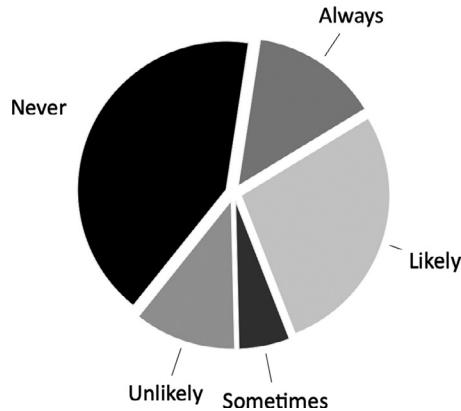


Figure 1. Proportions of respondents to the question: "How likely are you to use adrenaline-containing local anaesthetic in digital blocks?".

standard of care. We sought to establish how persistent the concern regarding ACLA is, in order to be able to address clinicians' concerns and bring about a change in practice that has been many years in the making.

We undertook a cross-sectional survey of medical practitioners in our institution, including all grades of Plastic Surgeon, and Emergency Nurse Practitioners. Even despite routinely undertaking WALANT surgery in our unit, we found a significant persistence of aversion towards ACLA in digital blocks (Figure 1). 62.5% of consultant Plastic Surgeons and trainees would at least be 'likely' to use ACLA, compared to just 7.7% of nurse practitioners. Amongst the surgeons, subgroup analysis showed a tendency for sub-specialists in hand surgery to be more comfortable using ACLA, compared to generalists. Interestingly, one department declined to circulate the survey amongst doctors, as they had a blanket departmental protocol prohibiting the use of adrenaline in digital blocks.

Concern about the use of ACLA invariably comes from fear of causing digital necrosis as a result of vasospasm in an end arterial system (and subsequent fear of litigation). This is borne out in our survey, where the majority of respondents who were reluctant to use ACLA cite concerns about ischaemia. This principle of practice has come from combinations of books (27%), teaching sessions (54%), senior advice (23%), and policy (15%); it has not come from contemporary literature as to the best of our knowledge, robust evidence against ACLA in digital blocks does not exist. It is certainly true that part of the intended affect of ACLA is peripheral vasoconstriction resulting in an improved surgical field, and reduced bleeding from wound edges into dressings. However, numerous basic science and clinical studies have demonstrated that the effect is sufficiently temporary so as not to risk necrosis, even with high concentrations of adrenaline.¹ In any case, reversal is possible using phentolamine, an anti-adrenaline agent that reverses adrenaline-mediated vasoconstriction by direct antagonism of α -adrenergic receptors. We have been able to make simple arrangements with our pharmacist to ensure that phentolamine is readily available within theatres, should it be needed. It can be administered to previous injection sites at a concentration of 1 mg in 1 ml according to published guidance in the "Wide Awake Hand Surgery Handbook" from the British Society for Surgery of the Hand.⁴

Some surgeons in our survey expressed a preference for tourniquet rather than ACLA for controlling the surgical field, as they believe tourniquets work more effectively, and because the effects of adrenaline-mediated vasospasm takes time to work. These are examples of practical reasons whereby the avoidance of ACLA could be considered legitimate; it may also be true that for training surgeons the learning curve required for undertaking WALANT, and the fact that full haemostasis is possible quickly and easily with a tourniquet, adds a level of complexity when basic surgical skills are still being acquired.

We are convinced of the benefits of ACLA in performing surgery in the hand and digits in very many, if not most, cases - accepting that there are times where it is not appropriate, and that surgeon preference is always a relevant factor. We have found that the surgical dogma discouraging the use of ACLA continues to be passed through generations of surgeons through many formal channels including Trust policies and medical school teaching. Even theoretical or minimal risks of digital ischaemia can be allayed by the provision of phentolamine in appropriate clinical areas. We would encourage units to take this simple step with an aim to more widely adopt ACLA in hand surgery, for the benefit of both patients and future generations of surgeon.

Declaration of Competing Interest

No conflicts of interest to declare

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Ethical approval

Not required.

Informed consent

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Contribution declaration

CD and CM conceived the study and researched the literature. All authors contributed significantly to the design of the study and analysis of the data. KJ and SD recruited participants and collected data. CD wrote the first draft of the manuscript. All authors reviewed and approved the final version of the manuscript.

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