

A Modified Bowel Clamp Technique for Ischemic Preconditioning

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ABSTRACT

We report an alternative method in the application of bowel clamp for ischemic preconditioning of pedicled flaps. The proposed method minimizes tissue damage and patient discomfort.

INTRODUCTION

According to Cheng et al,¹ the concept of ischemic preconditioning was first reported by Murray et al in 1986 on myocardial muscle by inducing multiple episodes of brief ischemia that were followed by prolonged ischemia. This concept was later applied by Mounsey et al to the latissimus dorsi flap in a pig model that has been shown to exert a protective effect on skeletal muscle.¹ Ischemic preconditioning is believed to attenuate vasospasm and ischemic reperfusion injury and to increase capillary perfusion and tissue oxygenation, allowing for earlier division of a pedicled flap and improved survival.¹⁻³

TECHNIQUE

Cheng et al¹ describe the bowel clamp technique as readily available and as easy to apply. However, the technique is associated with marked discomfort and often is not tolerated.¹ We describe a modification of this technique using DuoDERM Extra Thin (ConvaTec Ltd, Deeside, Flintshire, England) on the serrated edges of the bowel clamp blades and elastic traction to obtain sustained pressure to prevent excessive pressure and patient discomfort.

The DuoDERM is cut into 2 strips and is applied to the noncrushing bowel clamps (Figure 1). The mod-

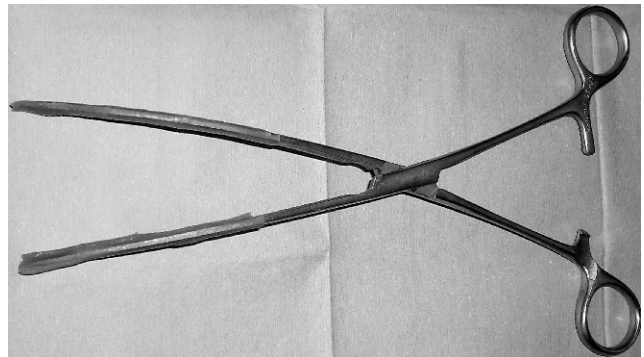


Figure 1. DuoDERM Extra Thin cut in strips and applied to bowel clamps.

ified bowel clamp is then applied to the pedicled flap, which requires ischemic preconditioning before definitive division (Figure 2). The bowel clamp is secured using an elastic band to achieve the desired pressure. Local pain will subside gradually because of tolerance and decreased ischemia by neovascularization.¹ The elastic band is gradually tightened according to



Figure 2. "DuoDERMed" bowel clamp for ischemic preconditioning.

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patient tolerability several times a day over the next few days.

CONCLUSION

This modified bowel clamp technique allows for pressure to be applied evenly across the pedicle, and tightness can be easily controlled using a rubber band until the clamp can be locked. It is an effective method for assessment and ischemic preconditioning of a pedicled flap to facilitate early division.

REFERENCES

1. Cheng MH, Chen HC, Wei FC, Su SW, Lian SH, Brey E. Devices for ischemic preconditioning of the pedicled groin flap. *J Trauma*. 2000;48(3):552–557.
2. Whetzel TP, Stevenson TR, Sharman RB, Carlsen RC. The effect of ischemic preconditioning on the recovery of skeletal muscle following tourniquet ischemia. *Plast Reconstr Surg*. 1997;100(7):1767–1775.
3. Cheng MH, Chen HC, Wei FC, See LC, Lee HY, Wang CJ. Combined ischemic preconditioning and laser Doppler measurement for early division of pedicled groin flap. *J Trauma*. 1999;47(1):89–95.