



Innovation Article

Design and development of unstuck tourniquet

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ABSTRACT

Background: Existing tourniquets often get stuck, so innovation is needed to develop unstuck tourniquets.

Technic: The result of the development of the tourniquet is only to modify the location of the locking system. The locks are located on the right and left sides, with an internal locking system that uses a bent angle design, which functions as a spring force to push the lockout without obstacles. The outside of the locking system has nuts and bolts that hold the cuff tighter when used.

Conclusion: The results of the development of this tourniquet are proven easy to use, comfortable, and unstuck.

INTRODUCTION

Tourniquets are used to block blood vessels when taking blood or when installing an IV.¹⁻³ However, the current tourniquets often get stuck in the lock when open.^{4,5} This results in discomfort for the patient.⁶⁻⁸ The innovation of developing an unstuck tourniquet is the solution to this problem. There has yet to be any development of an unstuck tourniquet. Previous research only designed digital tourniquets which focused on stopping bleeding.^{3,9-13} This research aims to design and develop a new tourniquet that is easy to use, comfortable, and unstuck.

TECHNIC

Modifications focus on the location of the lock and locking system on the current tourniquet. In Figure 1, the current location of the tourniquet lock is at the top and has a protruding locking part to hold it in place when used, but it is felt that this could hinder release. Additionally, there is no support on the cuff, making the tourniquet not tight when used. In Figure 2 (a modified tourniquet), the location of the lock is on the right and left sides. On the inside, the

locking system is designed with a bend angle, which functions as a spring force, so the lock comes out without resistance when released. The outside of the locking system has nuts and bolts next to the lock. Its function is to hold the cuff tighter when used.

DISCUSSION

This tourniquet has been tested on and off more than 100,000 times; as a result, this tourniquet is still in good condition (unstuck). In terms of form and function, this tourniquet is similar to current tourniquets; the only difference is in the locking system by adding a bending angle, which functions as a spring force.¹⁴ Apart from that, the addition of nuts and bolts on the side of the tourniquet functions to keep the cuff tight when used so that it is very effective and suitable for use.¹⁵

CONCLUSIONS AND RECOMMENDATION

A new tourniquet that is easy to use, comfortable, and unstuck has been created. Medical personnel are advised to use this tourniquet when drawing blood or installing an IV.

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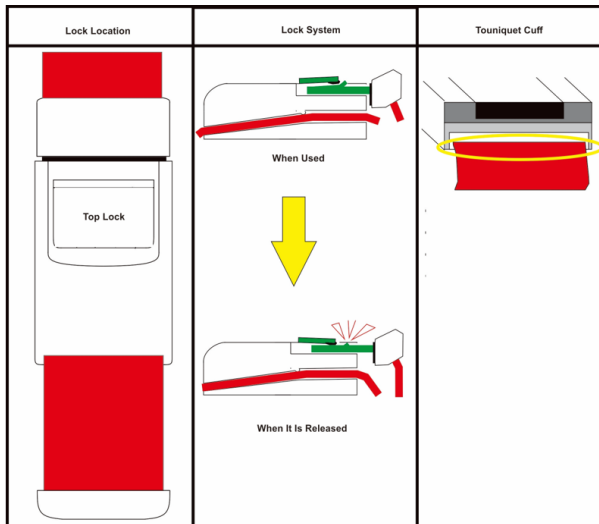


Figure 1. Tourniquet Conventional

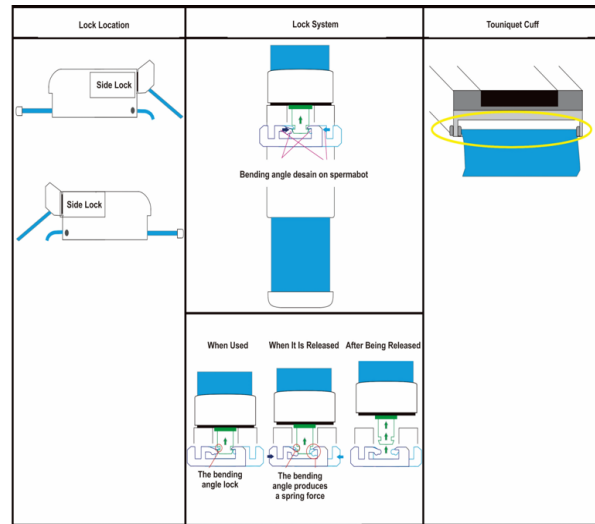


Figure 2. A New Tourniquet

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