

## An Improvised Active Drain

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### ABSTRACT

An improvised active drain is designed from intravenous infusion set and recycled Redivac<sup>®</sup> or Haemovac<sup>®</sup> bottle. Outcome of the use of this system on 100 patients is presented. This suction drainage system had been used in major orthopaedic and common minor surgical procedures and no significant complication was observed. This improvisation is relevant in a depressed economy where it is difficult to buy new sets of this type of drainage system (*Nig J Surg Res* 2000; 2:161-163)

*KEY WORDS: Active drain, improvised*

### Introduction

Redivac<sup>®</sup> and Haemovac<sup>®</sup> drainage systems are active drains used prophylactically or therapeutically. These can be recharged after single use.<sup>1</sup> These drains are frequently unavailable in our environment and improvising becomes necessary at times of need. They are made of a tube connected to a charged bottle (Redivac) or compressible container (Haemovac). These containers can be charged up to 70-600mmhg negative pressure, with a functional capacity of 250ml – 300ml<sup>2</sup> (Figure 1).

This report describes a method of recycling the system using perforated end of a sterile intravenous line to replace the used manufacturer's tube and introducer.

### Materials and Method

One hundred consecutive patients undergoing limb surgery at Ahmadu Bello University Teaching Hospital, Kaduna between January and December 1999 were included in the study.

The type of surgery, wound infection rate and other complications associated with the use of the system were prospectively assessed.

The needle end of a sterile intravenous infusion set was cut off and multiple fenestrations of 20cm length from the cut end were made using straight scissors. With the aid of a long curved artery clamp and a stab wound the perforated end of the tube is introduced into the wound through a virgin spot on the limb. Once the procedure is over the tube is anchored to the limb by nylon 2/0 suture, using Bar-Maor's technique- (tightly encircling the drain and not occluding the lumen).<sup>3</sup> A suctioning machine is used to create a vacuum in the container of 400 – 600mmHg pressure. The tube is now connected to a charged container which had been disinfected with Savlon<sup>®</sup>, Cidex<sup>®</sup> or Hibitane<sup>®</sup> or boiled for 30 minutes. The valve from the container is opened for active drainage. The drains are usually removed within 48–72hrs of surgery.

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## Results

The age range of the patients was 9-63 years (mean 29.3 years). M:F ratio was 7:1. The range of operations in which the drainage system was used are summarised in table 1. The mean

duration of drainage was 48.3 hours (Table 2). Breakage and knotting of the tubes were the only complications observed during the study in 2 (2%) of the patients. No wound infection was associated with the use of this drainage system.

Figure 1: Diagrammatic Sketch of the System

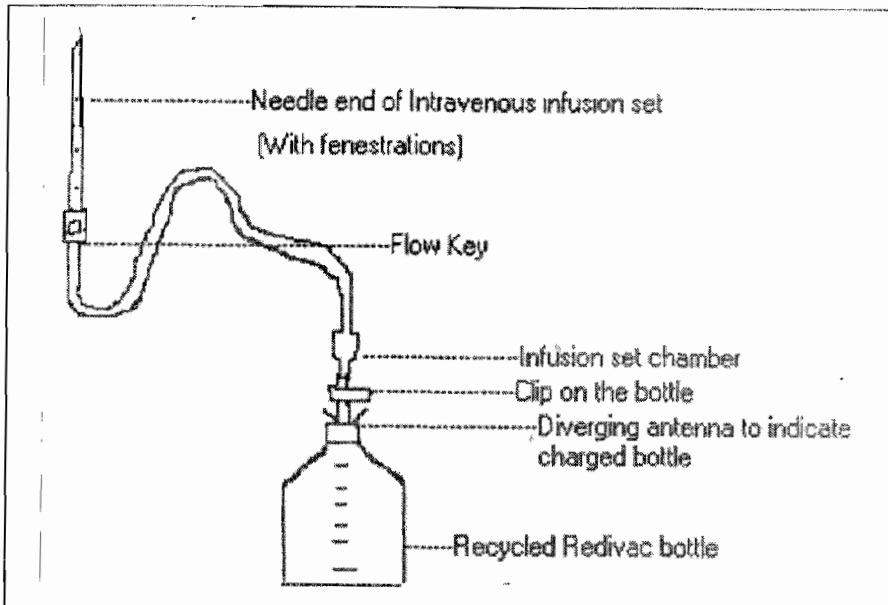


Table 1: Type of Surgery

Type Surgery	No.
Open reduction and fixation with Kuntscher nails	24
Incision & drainages of abscesses on the limbs	15
Lower limb amputations (above and below knee)	13
Excision of subcutaneous lumps (>5cm in sizes)	13
Arthrotomy for pyoarthroses	10
Open reduction and fixation with plates and screws	10
Girdlestone arthroplasty	7
Major upper limb amputations (above and below elbow)	5
Austin-Moore hemiarthroplasty	3
<b>Total</b>	<b>100</b>

## AN IMPROVISED ACTIVE DRAIN

Table 2: Length of Surgery

Duration (hrs)	No.
< 1	40
1 - 2	15
>2	45
Total	100

**Discussion**

Redivac® and Haemovac® are examples of active drainage Systems.<sup>1,4</sup> These could be scarce occasionally.

Open reduction and internal fixation of femoral fractures with Kuntscher nail was the commonest (24%) procedure used with this system (Table 1). Suction drainage is the preferred mode of drainage in open reductions of fractures.<sup>1</sup> Drainage was generally (83%) enforced for 48-72 hours as shown in table 2; however the duration of drainage was guided by the nature of the procedure and the amount of fluids drained.

This improvised drain is cheaper than a new set imported into the country and it

involves a simple technology. When used as described above it compares favourably with a new system.<sup>4</sup> It is therefore advised that only the tubes of the drainage systems should be discarded after each use. The containers should be disinfected and kept for recycling. It ensures proper diversion of resources to other equally essential surgical consumables.

**References**

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