

NEW METHOD TO DECREASE BUTTONHOLE LOCAL INFECTION RATE TO LESS THAN 1 IN 10,000

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INTRODUCTION

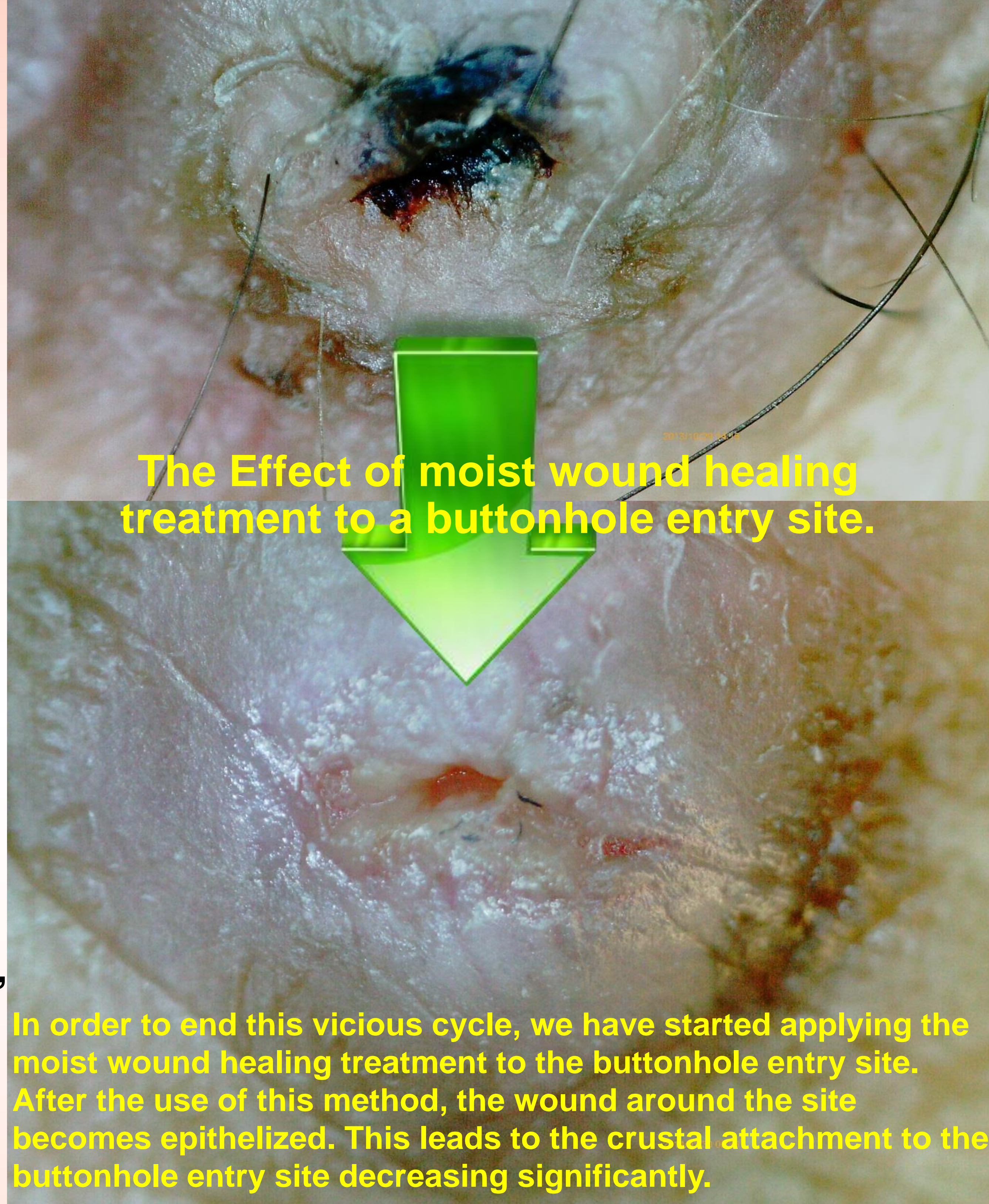
RESULTS

METHODS

The most serious problems of the buttonhole puncture method is the infection. We considered that at least one of the causes for the higher infection rate in the BH technique could be the insufficient removal of scabs. The crust left at the time of puncture may be pushed into the buttonhole tunnel by a dull needle and it must become the bacterial culture media. Commonly, the dried crust was removed with needles or forceps by force and this procedure tends to make wounds and the crust came to be fixed firmly.

To diminish crusts formation, we announced efficacy of the moist wound healing procedure on the buttonhole entry site from the 49th ERA-EDTA congress in 2012. In that announcement, we had used white petrolatum to cover the buttonhole entry site after removal of the needle. As a result, severe infection such as sepsis and hospitalization was prevented for 6 years in our clinic. To decrease local infection, we changed 2 points from our previous method. First, we started disinfection of the buttonhole entry site by using Oronine H[®], (Otsuka Pharmaceutical Co., Ltd) that contains 0.2% chlorhexidine in substitution for white petrolatum. Second, we used the new type of dull needle, the supercath clump cath P painless needle, (Medikit Co., Ltd). The tip is round and the thorn is slim and long than the normal dull needle. For this shape, the crust is hard to be pushed into the tunnel. (Figure 2)

This is the commonly observed buttonhole entry site with crust. If the scab is torn off using a digging force, it tends to wound the entry site and causes the recurring scab to become more deeply and firmly entrenched. This vicious cycle exists in most dialysis centers around the world



The Effect of moist wound healing treatment to a buttonhole entry site.

In order to end this vicious cycle, we have started applying the moist wound healing treatment to the buttonhole entry site. After the use of this method, the wound around the site becomes epithelized. This leads to the crustal attachment to the buttonhole entry site decreasing significantly.

Figure 1. Moist wound healing method prevents scab formation.

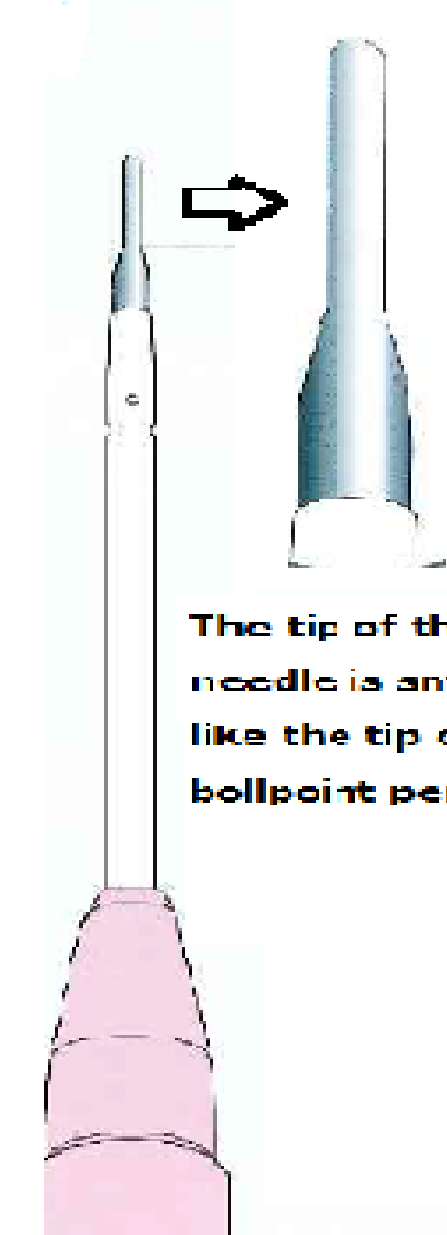


Figure 2. The shape of supercath clump cath P painless needle. (Medikit Co., Ltd)

Puncture methods	BH	RL	P value
Rate of local infection (events/10000 punctures)	0.92	0.96	0.335

Table1. Comparison of infection rate in both groups

Then, we instructed patients to wash buttonholes using a commercially available microfiber cloth at home and then to apply the white petrolatum on the site. Before next puncture, we put 0.2% chlorhexidine-soaked gauze for three minutes to disinfect before the puncture. Using this method, in many cases, scabs could be wiped off easily. We investigated the difference of infection rate between Buttonhole method and rope-ladder method. We checked carefully for signs of infection such as redness, swelling, pain, and pus formation. Also, we checked for symptoms of bacteremia such as a high fever.

RESULTS

As a result, 133 sites were punctured by using the rope-ladder method and 69 sites were punctured by using the buttonhole puncture method. In both groups, the severe infection such as sepsis nor hospitalization did not occur through one year. Local infection occurred 0.92 times / 10000 puncture opportunities in the buttonhole puncture method using the painless needle, and 0.96 times / 10000 puncture opportunities in the rope ladder method. There was no significant difference between the two groups (p= 0.335, Pearson's chi-squared test).

CONCLUSIONS

Moist wound healing prevented the heavy infection cases such as bacteremia or hospitalization in buttonhole method. In 2012, rate of localized signs of infection in standard versus buttonhole needling was reported to be 22.4 versus 50 per 1000 (P=0.003) by MacRae JM et al.

In this study, new moist treatment using chlorhexidine-containing ointment and painless needle decreased the local infection of the buttonhole method to one of 10,000 times or less.

METHODS

This study was conducted at Yokohama Minami Clinic through one year of 2016. Patients were treated by either the buttonhole or the rope ladder puncture method, and in some cases, a combination of both. In this study, two types of needles were compared. One is the painless needle and another is the sharp needle which have the same outer shell. On the buttonhole site, after having confirmed hemostasis after dialysis, we put a small amount of oronaine H ointment on the buttonhole entry site and covered it with an adhesive plaster to keep the site moist.

