

BUTTONHOLE PUNCTURE METHOD AS SAFE AS ROPELADDER PUNCTURE METHOD

Kazuhiko Shibata¹, Hidehisa Satta², Tadashi Kuji³, Masahiro Nishihara⁴, Seiichi Kawata³, Naoaki Koguchi³, Tomoko Kaneda¹, Shigeki Toma⁵, Gen Yasuda⁶

1 Yokohama Minami Clinic Yokohama, JAPAN, 2 Kasama clinic, 3 Yokodai Central Clinic, 4 Toshin Clinic
5 Toma Naika Clinic, 6 Yokohama City University Medical Center, Kidney, hypertensive department.

Correspondence: k.shibata@houshinkai.or.jp

INTRODUCTION

After we started the moist wound healing method for the buttonhole entry site in 2010, severe infection such as bacteremia did not occur at all. However, we could not prevent local infections. One reason for access-related infections in the buttonhole method may be difficulty in the removal of scabs created at buttonhole entry sites and bacterial contamination of these scabs. Therefore, measures to prevent access-related infections may be to use an effective disinfectant to diminish bacterial count. Furthermore, we should try to completely removal scabs formed at the buttonhole entry site.

METHODS

We made it a rule to choose the cannulation method based on the condition of access vessels. Accordingly, the vessels were cannulated either by buttonhole or rope-ladder method, or in some patients, arterial and venous cannulations were performed by different methods. In this study, the buttonhole entry site was treated with the moist healing method by applying white petrolatum at the buttonhole entry site after removal of the needle. This was followed by covering the site with an adhesive plaster. Immediately before the next hemodialysis, the scab formed at the buttonhole entry site was covered for 3 minutes with a piece of gauze soaked with either 0.4% povidone iodine solution or 0.2% chlorhexidine gluconate solution. The scabs were then removed by forceps. In this study, gauze soaked with povidone iodine solution was used for 4 months and the gauze soaked with chlorhexidine gluconate solution was used for another 4 months. In contrast, the skin site which was set to be cannulated by the rope-ladder method was rubbed with 83% alcohol cotton swab containing 1.0% chlorhexidine gluconate. During both the 4-month povidone iodine period or the 4-month chlorhexidine gluconate period, we compared the incidents of access-related local infections for buttonhole cannulation and rope-ladder cannulation.

RESULTS

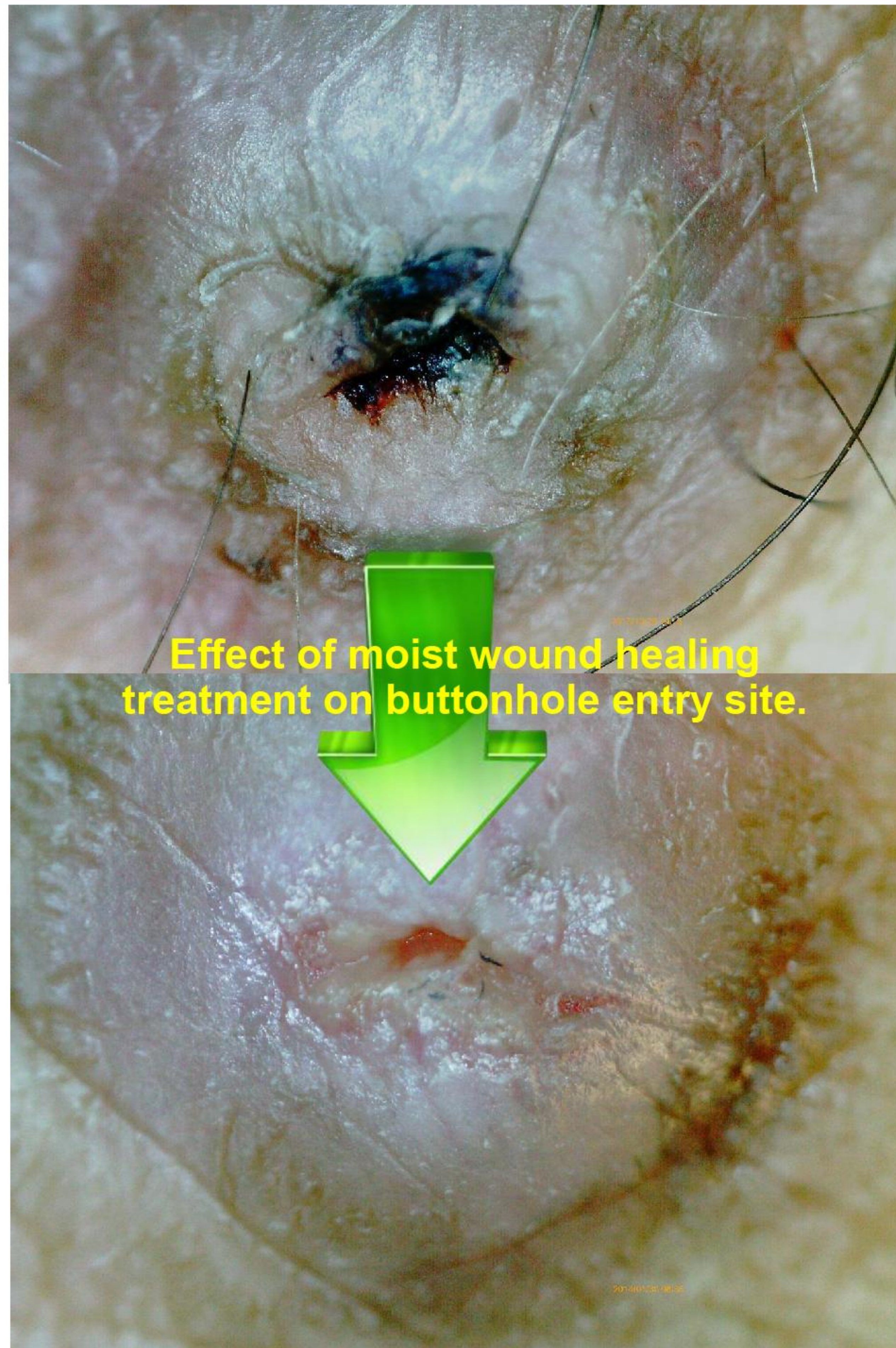


Figure 1. Moist wound healing method prevents scab formation.

	BH	RL
Povidone iodine period	184	92
Chlorhexidine gluconate period	184	108

Table1. The number of puncture site of each period.

	BH	RL	P value
Povidone iodine period (events/1000 punctures)	1.03	0.00	0.025
Chlorhexidine gluconate period (events/1000 punctures)	0.31	0.42	0.752

Table2. Rate of infection comparison of both period

RESULTS

During the povidone iodine solution period, 184 sites were cannulated by the buttonhole technique and 92 sites by the rope-ladder method. During the chlorhexidine gluconate solution period, the buttonhole method was used for 184 sites and the rope-ladder method for 108 sites. The moist healing treatment method allowed scabs to be removed easily and almost completely. Unfortunately, during the povidone iodine solution period, incidents of local access infections were significantly higher at 1.0 events/1000 punctures in buttonhole cannulation, than 0 events/1000 punctures in rope-ladder cannulation ($p=0.025$, Pearson's chi-squared test). During the chlorhexidine gluconate solution period, there were no significant differences ($p=0.75$) in incidents of local access infections by comparing buttonhole cannulation (0.31 events/1000 punctures) and rope-ladder cannulation (0.41 events/1000 punctures). However, after the introduction of the moist healing method on the buttonhole entry site, no bacteremia developed as part of an access-related infection. In addition, there have been no incidents of hospitalization for serious access-related infections for the past 5 years in our facility.

CONCLUSIONS

The combination of effective scab removal by the moist healing treatment and the diminishing of bacteria by covering a site with gauze soaked with 0.2% chlorhexidine solution is a more effective measure to prevent access-related infections in buttonhole cannulation.

