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Less Painful Blood Access Vessel Puncturing Buttonhole Technique

Synopsis from the article: [Toma S, Shinzato T, Fukui H, Nakai S, Miwa M, Takai I, Maeda K. A timesaving method to create a fixed puncture route for the buttonhole technique. *Nephrology Dialysis Transplantation* 2003;18:2118-21. Updated to the latter part of 2005.](#)

A. Buttonhole method to date

Changing the site of the blood access vessel puncturing has so far been considered desirable for each hemodialysis treatment. However, reports have indicated that insertion of the dialysis needles in exactly the same spot for consecutive dialysis treatments is preferable to changing the puncture site for each dialysis if one wishes to avoid complications.

To perform the buttonhole puncture, first one must create a fixed route for the dialysis needle to reach the access vessel. Twardowski reported that for a successful creation of a fixed puncture route, the same skilled medical staff is required to puncture the same site of the access vessel using sharp needles at each dialysis treatment during a certain initial period.

B. New buttonhole approach

We have recently proposed a new and practical method to create a fixed puncture route. First of all, at the end of a routine dialysis treatment, the dialysis needles are removed, followed by the stoppage of bleeding. Then, at one of the needle puncture sites, a dull-tipped, thumbtack-shaped, 5-mm long, polycarbonate peg (BH Stick[®], Nipro Corporation, Osaka, Japan) which does not quite reach the access vessel when entering from the skin, is thrust toward the access vessel along the path previously taken by the just-removed dialysis needle.

Staying at this site until the end of the next dialysis session, the peg is then replaced by a new one. This step is repeated after each dialysis over a period of 2 weeks. After withdrawing the final polycarbonate peg, a conventional dialysis needle (i.e., a sharp-tipped needle) is inserted along this newly created path with the intention of puncturing the vessel wall located more distally, in order to complete a new buttonhole puncture route.

C. Buttonhole punctures using fixed puncture routes established by the peg-indwelling method

During the 5 years from June of 1999 through September of 2005, we have employed the above buttonhole puncture approach using dull puncture needles some 50,000 times in 86 patients. In 92% of these patients, the pain associated with the puncture of blood access vessels was either alleviated or abolished altogether. The time required for bleeding to stop at the puncture sites following withdrawal of the needles has tended to be shorter with the buttonhole puncture method than with the conventional puncture technique.

Commentary by Todd S. Ing, MD

Dr. Toma and his colleagues have devised a novel approach to create a buttonhole track for dialysis needle insertion into arteriovenous fistulas by the use of an indwelling polycarbonate peg. The buttonhole method¹, first championed by Twardowski, is rapidly gaining popularity, especially among home dialysis patients. If confirmed by other investigators, Dr. Toma's approach may help to popularize further the buttonhole technique for use in the case of arteriovenous fistulas.

Reference:

1. Twardowski ZJ. Constant site (buttonhole) method of needle insertion for hemodialysis. *Dialysis & Transplantation* 1995;24:559-60, 576.