

TECHNICAL NOTE : NON INVASIVE METHOD TO PROTECT THE EXTERNAL PART OF CATHETERS OR FLOW PROBES CHRONICALLY IMPLANTED IN RABBITS

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ABSTRACT : This technical note describe the steps of fabrication of a protective backpack for the external part of catheters or flow probes chronically implanted in rabbits. This backpack is made with fabric and

velcro®, and the straps are made with electric wire which cannot be nibbled by the animal. This method is non invasive and does not modify the animal behaviour (caecotrophy, suckling, washing....).

RESUME : Note technique : Méthode non invasive de protection de l'extrémité externe des catheters et des sondes débitométriques implantés en chronique chez le lapin.

Cette note technique décrit les étapes de fabrication d'un sac à dos pour lapin permettant de protéger de façon efficace l'extrémité de

cathéters ou de sondes débitométriques implantés en chronique. Ce sac à dos est fabriqué à l'aide de tissu et de velcro®, les bretelles sont en fil électrique et ne peuvent pas être grignotées par l'animal. Cette méthode présente l'avantage d'être non invasive et ne modifie pas le comportement de l'animal (caecotrophie, allaitement, toilette..).

A major difficulty in chronic catheterization or flow probes implantation is to protect efficiently the external catheter or flow probe cable. When working with sows, the material is folded and placed in a protective purse directly glued to the skin (TROTIER *et al.*, 1995). However, this technique is not suitable for rabbits because animal hair (which grow again after shaving) prevent from having a good adhesion. Therefore, several techniques to protect the external catheter or flow probe cable in chronically implanted rabbits have been published, including a subcutaneous pocket made in a fold of skin (HALLS *et al.*, 1974) a steel and plastic box sewn to the subcutaneous tissues of the neck (CRANSTON *et al.*, 1977) or a plastic housing unit attached to the skin with surgical steel suture (SILS *et al.*, 1994). These techniques are quite invasive, prevent good surgical recovery and promote infections. Therefore, we developed a non invasive "backpack", light (25 g), small (6 x 6.5 cm), cheap (2 \$) and easy to make (30 min). It is made of fabric and the straps are made with electric wire which cannot be nibbled by the animal.

MATERIALS

- Strong fabric, 8.5 cm x 24.5 cm.
- Velcro®, 15 cm total cut in four pieces of 1x6 cm, 2x3.5 cm, 1x2 cm.
- Plasticized copper electric wire (mono-wire, cross-section = 1.5 mm², 60 cm).
- Sewing equipment (scissors, thread, needles and sewing machine).

METHODS

The different steps in the preparation of the backpack are represented in Figure 1 to 6. In a piece of fabric (8.5 x 24.5 cm) three holes (0.8 cm of diameter) are made according to the position shown in figure 1 and the central hole (hole I) is oversewn to make a buttonhole. All the holes are localised in a same half of the fabric. This half will be referred as the bottom of the backpack, and the other one as the cover. A hem of 1 cm wide is made all around the rectangle of fabric (dotted line in Figure 1).

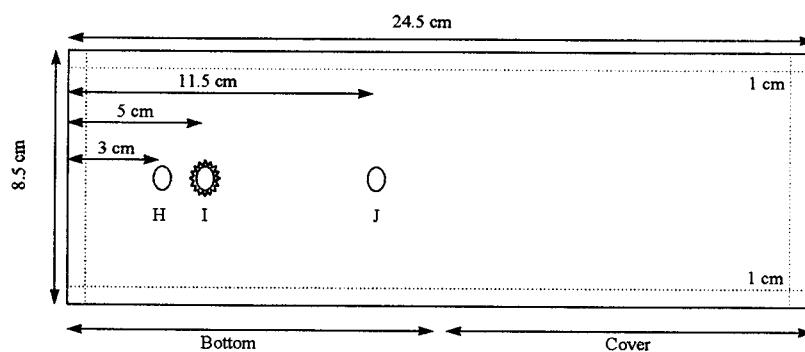


Figure 1

The piece of Velcro® of 2 cm long is attached to the cover of the backpack according to Figure 2 (please note that a piece of Velcro® is made of two complementary units).

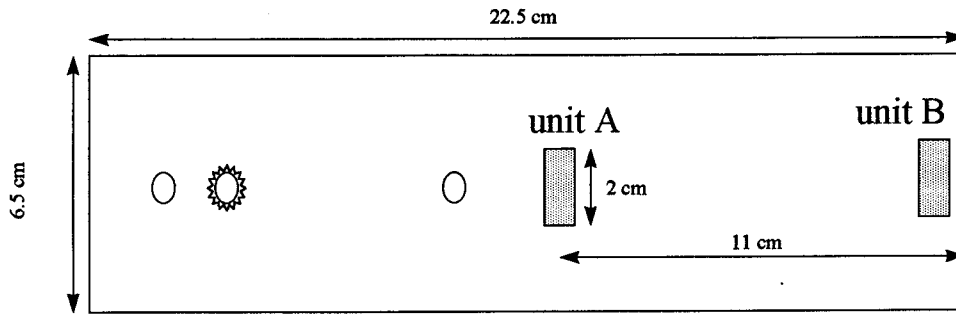


Figure 2

Now, the three others pieces of Velcro® are going to be sewn in the opposite face of the fabric as compared to the first one (see Figure 3). It is important to make sure that when one unit of Velcro® is attached to the bottom of the backpack its complementary unit is fixed to the cover of the backpack. At this point, the

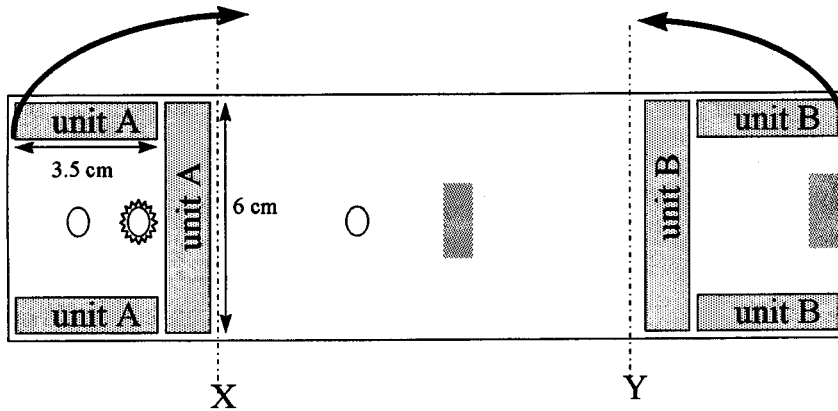


Figure 3

rectangle of fabric should be folded according to the axes X and Y shown in Figure 3, so that the three last pieces of Velcro® remain accessible in the outside while the first one is now hidden inside. Make sure that the 2 holes H and J are facing each other (Figure 4).

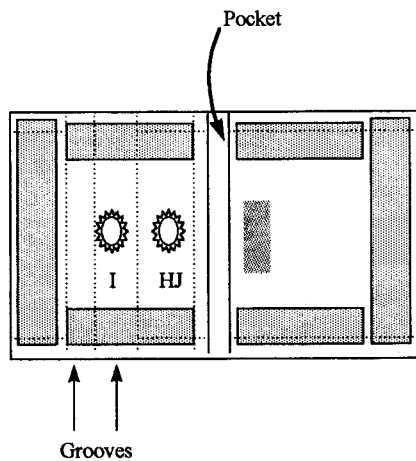


Figure 4

Holes H and J should be oversewn together to make a buttonhole. Seams should be made following the dotted lines shown in Figure 4. They will form two grooves in the bottom portion of the backpack. The electric wire is now slid inside the two grooves to form straps of the backpack, as shown in Figure 5.

They should be loose enough to allow the passage of the rabbit forelegs. In order to attach efficiently the backpack to the rabbit, the following protocol should be carefully respected :

1. The catheter or flow probe cable emerging from the neck of the animal is slid through the hole HJ of the backpack;
2. Forelegs of the animal are passed through the straps and fitted to the size of the animal by gently pulling the electric wire emerging from the hole I and twisting it (see Figure 6);
3. The catheter or flow probe cable is secured inside the pocket;
4. The cover of the backpack can now be pulled over the bottom.

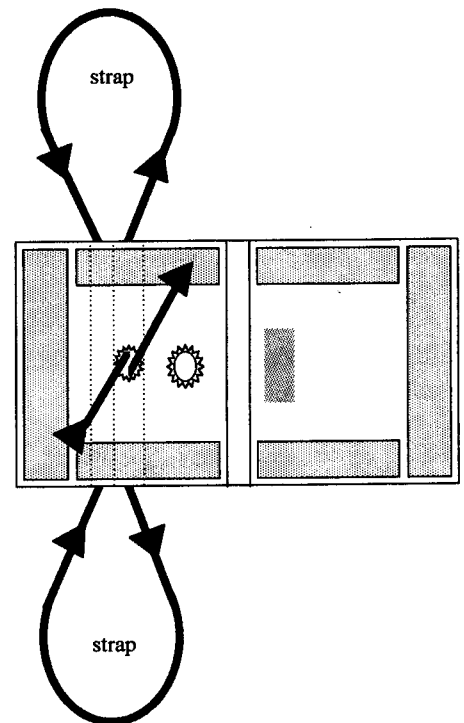


Figure 5

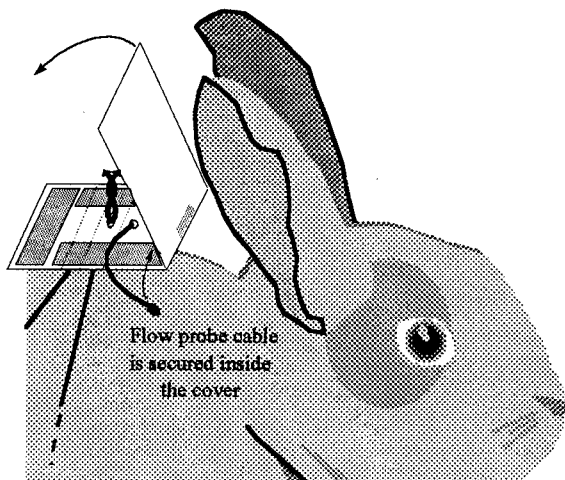


Figure 6

It is better to put the backpack in place when the animal is still under anesthesia, and to check that the straps fit correctly when the animal is awake.

CONCLUSION

The figure 7 shows the backpack on the implanted rabbit. If the straps are correctly fitted to the rabbit, the backpack does not modify the animal behaviour (nutrition, caecotrophy, suckling, washing ...) and could be supported several months.

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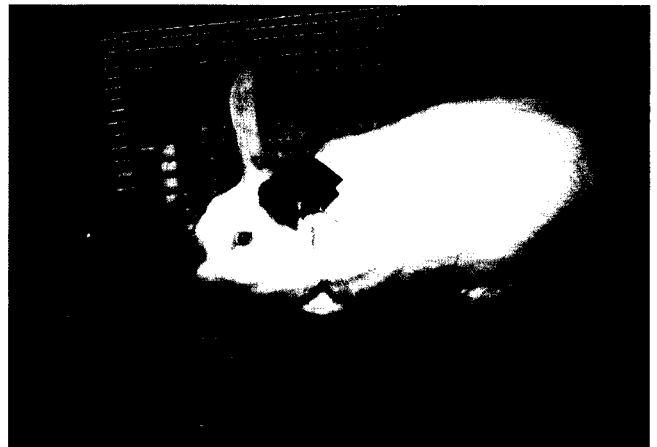


Figure 7

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