

## A suit for protecting chronically implanted devices in monkeys

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The preparation of an animal for chronic studies requiring the use of such fixtures as fistulas, catheters, electrical connectors, etc., involves much time and expense. To have these devices damaged during the time they are being used is both frustrating and costly. Recent work in this laboratory involving the use of rhesus monkeys with gastric fistulas and electrical connectors required that these devices be "monkey proofed" to prevent their damage by the animal.

The first attempt to provide this protection was less than successful. A cloth suit was fitted to the animal with plastic

cups sewn into the suit over the areas of the fistula and electrical connectors. The disadvantages of the cloth suit were many. The suits were often damaged by the monkey chewing on any loose strap or fold. The garments soiled easily and required frequent changing and laundering. Of greater concern, however, was that the necessity of having the suit fit snugly caused irritation of the tender areas immediately around the fixtures and to the surgical wounds, often preventing proper healing.

The second effort was far more successful. It consisted of a plastic "barrel" worn as shown in Fig. 1.

### Description

The plastic "barrel" was made from a piece of clear Plexiglas<sup>1</sup> tubing, 4 to 6 in. in diam and 5 to 6 in. long. Size, of course, depended on the size of the animal. Arm holes, 2 in. in diam and open at the top,

were cut in each side and padded with rubber tubing cemented in place with weatherstrip adhesive (3M No. 8011). Two inexpensive leather or plastic dog collars were cut and attached with small bolts (6-32 x 3/8 in.) to form the shoulder straps. These were crossed behind the animal's head to prevent their slipping off the shoulders. A neoprene rubber sheet, 1/16 in. thick, was fitted to the bottom of the barrel and a 3- to 4-in.-diam hole cut in the center. This flange was held in place with hose clamps, plumber's tape, or heavy wire. The purpose of this flange was to prevent the walls of the barrel from bumping the devices protruding from the animal. The flange is soft and flexible and the hole larger than the animal to lessen any chance of irritation. The completed device is shown in Fig. 2.

### Discussion

Eight rhesus monkeys with chronic



Fig. 1. Rhesus monkey in restrainer.

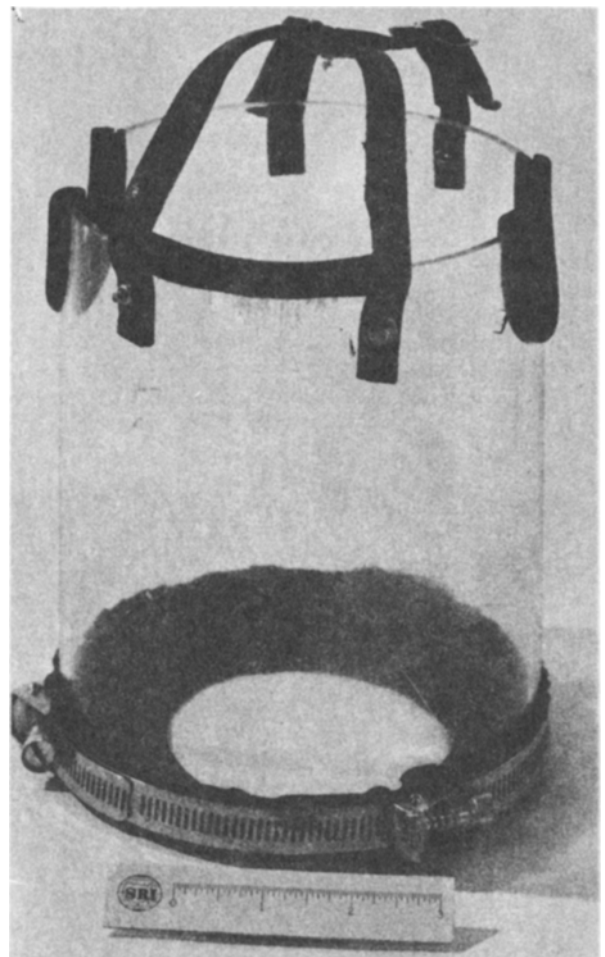


Fig. 2. Barrel restrainer with 3-in. scale.

fistulas and electrical connectors were kept in excellent condition for as long as 6 months in the plastic barrels. No signs of irritation due to the barrel were observed during the entire time they were worn. Daily inspection of the animals and the implanted devices was easily accomplished by being able to see through the clear Plexiglas. The animals suffered little loss of movement, although they were unable to touch the covered areas of their bodies. The barrels were easily put on or removed by simply unbuckling the shoulder straps

and slipping the barrel off over the animal's feet. Washing the barrel with soap and water was sufficient for cleaning and it was ready to be put back on the animal in a matter of a few minutes. Thus, only one suit was required for each monkey.

#### **Modifications**

The addition of a door in the side of the barrel would allow the E access to any chronic fixtures without having to remove the device. The animal could be restrained more rigidly, e.g., as in a primate chair, by

fastening the barrel to a suitable support.

#### **Conclusion**

The plastic barrel suit provides complete protection of chronically implanted fistulas and electrical connectors. The lost time, expense, and the frustrations of having these devices damaged was avoided.

#### **NOTE**

1. Plexiglas: Trademark of Rohm & Haas, Philadelphia, Pa.