

Description Of A New Disposable Cardiotomy Suction Well

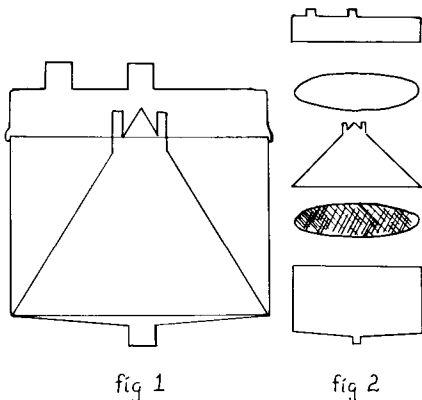
by

Richard S. Rog

University of Minnesota Hospitals

During the past decade of intracardiac surgery, many accessories for perfusion have been employed. This article deals with a recently devised disposable cardiotomy suction reservoir. The intention of this article is to describe this apparatus, its advantages and disadvantages.

This cardiotomy well is constructed of polypropylene plastic and consists of four basic parts: the well proper, dispersing cone, cover, and gasket. A fifth optional part, a filter, has just recently been added. The well body has a six inch diameter and a height of approximately four inches. The total capacity of this unit is 1500 cc with virtually no blood hold up. Figures 1 and



2 show the cardiotomy well in its assembled and disassembled state.

This unit has been incorporated into a DeWalt type bubble oxygenator system 1 and used for more than 200 clinical open-heart operations. It functioned well during all of these cases. During these cases it was used as a cardiotomy suction blood debubbler and reservoir. Blood was introduced to it both by positive and by negative pressure.

The debubbling is carried out by coating the inside surfaces of the well with an antifoam solution. The antifoam is of the same type which we use to coat the stainless sponges for our DeWalt type oxygenator. This debubbling process is described elsewhere. 2

The antifoam solution is prepared by mixing together 100 Gm. of high viscosity antifoam compound XC-2-0033* and anhydrous ether. This mixture is placed in a one quart glass jar and the remainder of the jar is filled with ether. It is then allowed

to sit for 24 hours with intermittent agitation during the first few hours. The fluid is decanted and the residue is discarded. The liquid portion is what is then used to coat the inside surfaces of the well. We do this by dipping a few 4 x 4 inch gauze sponges into the antifoam liquid and applying it freely to the inside surfaces. The well is then allowed to remain open to the air for a few minutes, allowing the ether to evaporate and the antifoam to adhere to the well. It is then placed in our pump pan to be sterilized. The well and our pump connectors are sterilized for seven minutes with the autoclave set at 270° Fahrenheit and 30 pounds of jacket pressure. When autoclaving the well, care must be taken to make sure that no pressure is exerted on it while the plastic is hot; otherwise, it will warp and bend.

The well can also be put up as a wrapped article and autoclaved with either gas or steam. When using this method, the routine sterilization procedure should be used.

Following sterilization, the cardiotomy is then linked together with the oxygenator by a short piece of either Mayon or Tygon tubing. Figures 3 and 4 depict two ways that this unit can be incorporated into the extracorporeal circuit. Figure 3 shows how the well is connected when negative pressure from a suction machine etc. is used. Figure 4 shows how the well is connected when roller pumps are used for suction and the cardiotomy blood then returns to the oxygenator by gravity drainage.

The advantages of this type of well are as follows: 1) it has a rigid body which will not collapse when negative pressure is used within the well to draw blood from the operative field, 2) being disposable, the problem of meticulous

cleaning of contaminated equipment is eliminated (of course, we do clean the wells thoroughly with a hospital detergent before siliconizing them), 3) the well is unbreakable because of its plastic construction, 4) it is comparatively inexpensive when produced in large quantities, and 5) even though the wells are considered disposable, they may be reused if they are thoroughly cleaned. We have used the same well for as many as 20 cases.

The one disadvantage that we think should be mentioned is the possibility of the antifoam washing off into the systemic circulation. This problem is one that is associated with about all siliconized surfaces.

Summary:

Recently a new disposable polypropylene plastic cardiotomy suction well has been devised and manufactured commercially.

The plastic reservoir is coated with an antifoam solution so that advantages of being disposable, easy to clean, inexpensive, unbreakable, non-collapsible, reusable if desired, and easily adapted to most extracorporeal circuits.

This well has the definite advantage of being easy to clean, inexpensive, unbreakable, non-collapsible, reusable if desired, and easily adapted to most extracorporeal circuits.

The single disadvantage is the fact that it must be siliconized and the possibility of antifoam "wash off" exists.

** Richard S. Rog and J. B. Wade, University of Minnesota Hospitals, Minneapolis, Minnesota

***Phelan Manufacturing Company, Minneapolis, Minnesota.

1. DeWalt, R. A., Lillehei, C. W., Hodges, P. C., Long, D. M., Wade, J. B. and Cardozo, R. H.: Description of the Helical Reservoir Bubble-Type Pump Oxygenator for Hemodilution Hypothermia Perfusion. *Diseases of the Chest*, 44:113-120, 1963.

2. Galletti, P. M. and Brecher, G. A., *Heart-Lung Bypass*, New York, Grune & Stratton, 1962.

* Dow Corning Co., Midland, Michigan.

