

sulci conceal septic matter which cannot be reached by irrigations, as the moment the fluid begins to distend the bladder such acute pain is produced that the bladder contracts with great force and prevents its even coming in contact with the deeper parts, much less washing away or rendering innocuous the concealed pus. As evidence of this, one can see almost immediately after the most thorough vesical irrigation with a two-way catheter, small quantities of urine voided, highly charged with pus, desquamated epithelium and other degeneration products.

It is to overcome this difficulty in reaching the source of infection that the vesical balloon is especially valuable.

At one of Dr. Kelley's clinics given during the meeting of the American Medical Association, in May, 1895, I exhibited an improvised apparatus, made by attaching a toy balloon to an English catheter, and demonstrated its method of application. Since then special balloons have been made which have proved in every way satisfactory.



FIGURE 1.

By means of this apparatus the bladder is distended, the rugæ smoothed out and all of the inflamed and infected areas are brought in contact with the vesical balloon, which is employed as the carrier of therapeutic remedies.

Rubber balloons have been introduced into the bladder and inflated preceding the repair of vesical fistulæ, to facilitate the operation, but so far as I am able to glean from medical literature, this is the first employment of such an apparatus for the treatment of cystitis.

#### THE VESICAL BALLOON.

The apparatus consists of a small balloon made of thin rubber, 6 cm. in diameter when collapsed, connected with a thicker rubber tube 26 cm. in length, with a small cut-off valve or clip to retain the air when the bag is inflated. These balloons can be distended to about the size of a well-filled normal bladder.

We have employed the surgical aspirator as the most convenient means for inflating the balloon, but the small rubber bulbs connected with nasal atomizers, or a cheap air pump like the bicycle-pump, are equally satisfactory.

The balloons are made of delicate rubber tissue, and if not carefully preserved are soon destroyed. They should be washed in warm water immediately after use, and then slightly inflated and allowed to dry thoroughly, in order to prevent the walls of the collapsed balloon from adhering together.

When the apparatus was in its experimental stage we used the oleaginous ointments, which were quickly found to decompose the rubber, and at the suggestion of Mr. Waltz, pharmacist to the Johns Hopkins Hospital, gelatine was used, which at once proved an ideal vehicle for remedies.

Gelatine possesses the advantages of melting at the body temperature and not injuring the rubber, and when brought in contact with the bladder it is quickly absorbed.

Up to the present time we have found a ten per cent. ichthyol gelatine very satisfactory. In addition to this we have had made up a bismuth, zinc, salicylic acid and bichloride gelatine, but so far have had no occasion to use them.

#### METHOD OF APPLYING THE VESICAL BALLOON.

Before using the balloon it should be boiled and placed in a boric acid solution or sterilized water. The capacity of the balloon should always be accurately determined previous to its use, by inflating it to the size