To eliminate radiation exposure during a radiological examination, I spent much time designing a simple device which could be used in the everyday practice. After many trials and refinements, I eventually developed a simple cheap air-activated device for remote injection during daily radiological examinations. One hundred and twelve hysterosalpingographies were performed smoothly using this device with satisfactory results both for the gynecologists and for radiologists. It is practical and easy to make and is economical without the need of electricity.

Key words: Hysterosalpingography, Infertility, Technology

In the infertility clinics, gynecologists solve many problems for the patients and one of the most common tests performed by them is hysterosalpingography. The aim is to determine the possible mechanical factors of infertility which accounts for almost 30% of cases of infertility [1], and open the tubes using the pressure generated during the study [2].

Hysterosalpingography (HSG) is a common test performed in the radiology department. Traditionally the gynecologist carries out the examination near the examination table using a remote diagnostic X-ray machine. The radiologist takes pictures while injection of contrast medium is made by the gynecologist who is exposed to ionizing radiation together with the patient inside the examination room. Some radiologists perform HSG without the help of gynecologists. Nevertheless, doctors are exposed to ionization radiation ranging from 75 to 750 millirads during the studies [3].

In the prospect of eliminating radiation exposure in daily practice, I developed a simple and easy way to solve this problem. By simply combining syringes back to back fixed on a wooden board using clips and connecting with tubing and foot-pump outside the examination room, a simple remote injection device (Fig. 1) was created. It has been used successfully in 112 HSG studies.

I hope that this kind of device can be used widely in our country and bring more protection against radiation to both gynecologists and radiologists.

MATERIALS AND METHODS

From December 1998 through December 2000, 112 patients, aged between 24 and 46 years old (mean age, 30 years old), who underwent HSG
during surveys of infertility at our hospital were enrolled in this study.

All HSG studies were performed by the gynecologists using the Jarcho type cannula. Each patient was placed in the lithotomy position at the end of the examination table. An operating speculum was introduced into the vagina and the cannula was introduced into the cervix. The speculum was then loosened to reduce discomfort. The contrast medium was injected using a remote injection device which consisted of a 50 ml syringe fixed to a wooden board and connected by a silicone tube to a foot air-pump outside the examination room. The other end was connected with a 20 ml syringe filled with 10 ml contrast medium for injection (Fig. 1).

RESULTS

One hundred and six patients completed the studies smoothly which led to appropriate diagnoses using the remote injection device. The procedure failed in six patients due to severe adhesions with increased resistance within the cervical cavity.

DISCUSSION

Remote injection device is a cheap, convenient, and practical tool for HSG study. No ionization radiation relating to these procedures was applied to the radiologist or gynecologist. This prompts gynecologists to order and to perform more HSG studies. It also is more beneficial to the hospital as it provides more stable working conditions for the personnel and more income for both the personnel and the hospital.

The maximal speed of this device is 10 ml per second for the contrast medium injection and the minimal speed is 1 ml per second. These speeds are suitable for many studies such as HSG and cholangiography. We can stop injection at any moment and entire cessation of injection can be achieved by simply turning off the connecting button at the foot pump. However, we cannot adjust the injection speed precisely enough, so it would NOT be suitable for triphasic computed tomography (CT) study of the liver.

The foot-step pump generates pressure ranging from 30 to 40 psi (pound per square inch). There is no pressure differences between the patients with normal HSG result and patient with synechia. The safety limit (maximal pressure) of the pump is 40 psi. For those failure cases, pressure had reached nearly 40 psi, but no opacification of the uterine cavity could be made.

I also performed some cases of T-tube cholangiography, cystography and lower GI series with the help of this device. I hope that other imaging studies such as retrograde pyelography can be done by the use of this remote injection device after modification in the future.

REFERENCES

以自製遙控注射器作子宮輸卵管攝影

劉武翘

怡仁綜合醫院 放射線科

介紹一種新近製作的遙控注射器具，不需使用電力，利用氣壓原理，以腳踏打氣筒驅動連接之針筒，再驅動緊鄰之針筒予以注射。經過112例的子宮輸卯管攝影，只有6名因嚴重粘連而顯影不良。証明本注射器非常實用，適合日常放射線部門使用。

關鍵詞：子宮輸卵管攝影，不孕，技術