

OUTCOME OF INADVERTENTLY PERFORMED HYSTEROSALPINGOGRAPHY DURING EARLY PREGNANCY—7 YEARS AFTER BIRTH

Chung-Hai Kuo*, Haung-Chi Lin¹, Ming-Hao Chang

Departments of Obstetrics and Gynecology, and ¹Pediatrics, En Chu Kong Hospital, Taipei, Taiwan.

Hysterosalpingography (HSG) is currently a common diagnostic and investigational tool used to diagnose women with infertility [1]. In order to avoid any radiologic exposure to the embryo, this examination is performed within the first 14 days of the menstruation cycle. However, decidual spotting or bleeding sometimes occurs in early pregnancy, and thus, there is a possibility of the procedure being done during an unsuspected pregnancy [2]. Little information exists as to whether there are any adverse effects of HSG on pregnancy [3,4]. We present the radiologic findings of HSG performed during early pregnancy and the outcomes of the child 7 years after birth.

A 21-year-old woman, gravida 0, para 0, with a regular menstrual cycle, had primary infertility for nearly 2 years. She had undergone some blood tests at another clinic but could not remember which tests were performed; no abnormal results were noted. Semen analysis of her husband was performed and did not reveal abnormal findings. She visited our outpatient department, and three cycles of clomiphene treatment were given between March 30, 1999 and September 6, 1999. HSG was arranged on the 8th day of her menstrual cycle on September 13, 1999 (last menstrual period, September 6, 1999), and showed a space-occupying lesion (Figure 1) within the uterine cavity [5]. Ultrasound examination was performed immediately, and an intra-uterine gestational sac (crown-rump length, 11.9 mm) was found (Figure 2).

Considering that the total radiation dose of HSG to the uterus was no more than 1 rad, the parents decided to keep the pregnancy upon medical advice [6,7]. No signs of infection or abortion were noted.

The membrane ruptured spontaneously on March 15, 2000, at 34+ weeks of gestation (expected date of confinement, April 25, 2000), and cesarean section was performed owing to complete breech presentation. A live female baby, with the body weight of 2,114 g, was delivered. The baby required intensive care for about 1 month because of prematurity, before being discharged with normal results in all functional tests.

According to the parents' statements on the girl's growth and development, the accidental radiation exposure during HSG caused no apparent abnormalities. Her activities and reactions were no different from those of other children of the same age. For a more accurate assessment, an intelligence test (Wechsler Intelligence Scale for Children-III) [8,9] was administered to the girl 7 years after her birth. The results are shown in the Table and explained as follows:

1. The child underwent all tests smoothly, with no emotional reactions. The IQ (90) was slightly below average (verbal subtest score of 45, IQ=94, 34th percentile; performance subtest score of 39, IQ=85, 16th percentile; total subtest score of 84, IQ=90, 21st percentile).
2. Most of the recognition and performance abilities of this child were about average, except for the identification and vocabulary abilities which were below average.
3. Small children are usually not easy to handle. Strict standards are, thus, not reasonable. In this case, the extra activities during the test were obvious and were most likely due to curiosity, but may sometimes affect the total score. Generally, this was an average child.
4. The most common adverse effect of radiation is mental retardation. The results were for psychologic assessment only and did not include any possible organ injury. Further observations are warranted.

The effects of radiation on pregnancy have been studied in detail. The minimal teratogenic dose to the uterus is about 5 rads. Radiation doses on the uterus



*Correspondence to: Dr Chung-Hai Kuo, Department of Obstetrics and Gynecology, En Chu Kong Hospital, 399, Fuhshing Road, Sansia Town, Taipei County, Taiwan.

E-mail: chkuo23@gmail.com

Accepted: August 27, 2008

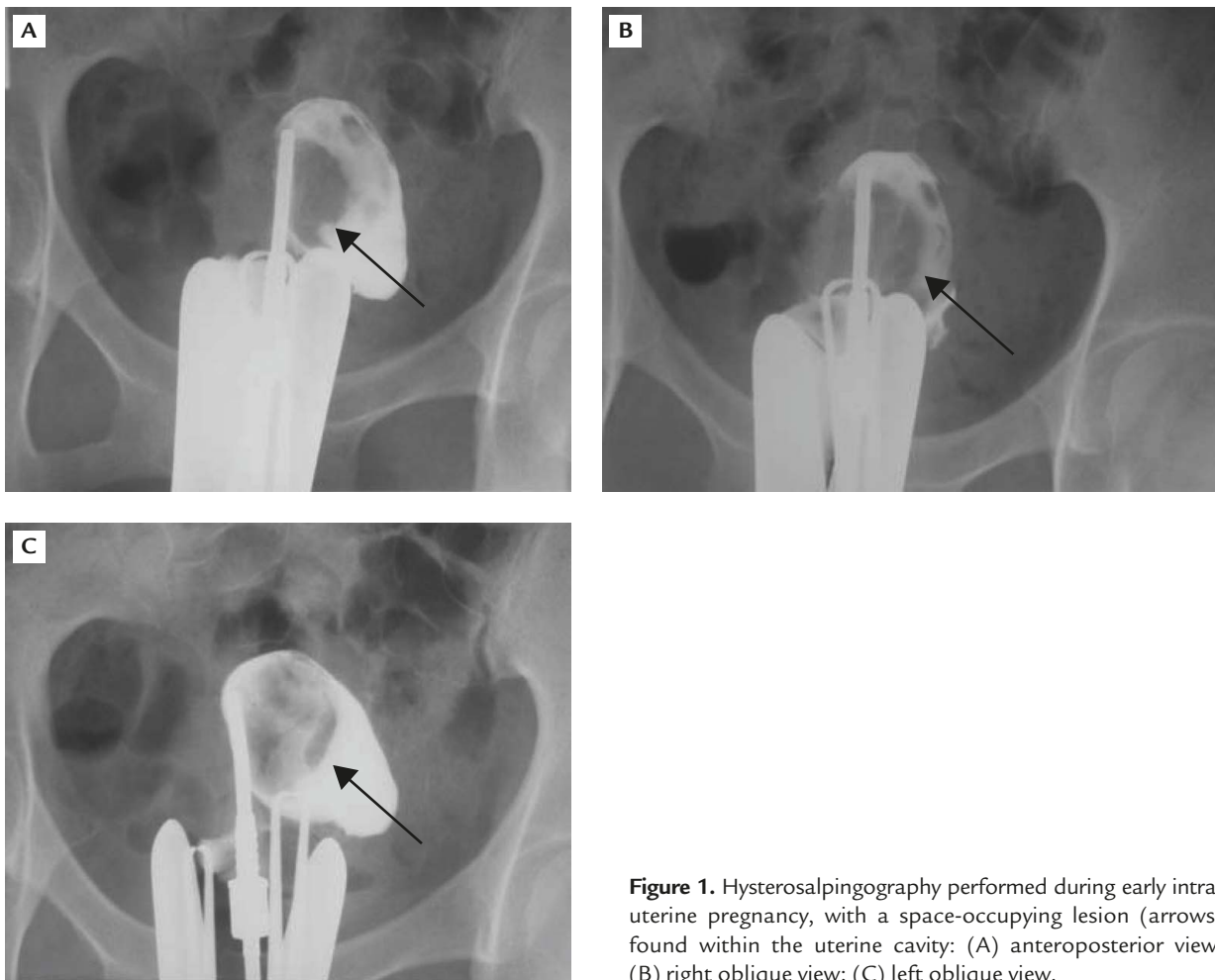


Figure 1. Hysterosalpingography performed during early intra-uterine pregnancy, with a space-occupying lesion (arrows) found within the uterine cavity: (A) anteroposterior view; (B) right oblique view; (C) left oblique view.



Figure 2. Ultrasound imaging of early intrauterine pregnancy after hysterosalpingography. A gestational sac with crown-rump length of 11.9 mm (gestational age, 7+ weeks) was identified.

from all kinds of radiologic examinations, including HSG, are thus summed up, to determine whether they are harmful [6,7]. HSG is a diagnostic tool used to diagnose female infertility and recurrent abortion [1]. Although

Table. Wechsler Intelligence Scale for Children-III	
Subtest	Scaled score
Verbal subtest	
Information	9
Similarities	10
Arithmetic	9
Vocabulary	7
Comprehension	10
Total score	45
Performance subtest	
Picture completion	4
Coding	10
Picture arrangement	9
Block design	6
Object assembly	10
Total score	39

every clinician knows that the examination should be arranged within the first 14 days of the menstrual cycle, unsuspected pregnancies sometimes do occur as the patients may confuse the decidual bleeding with

menstruation [2]. Such cases of unsuspected pregnancies are rare, since most women undergoing this test are not able to conceive easily. In this case of HSG performed during early pregnancy, the radiation dose to the uterus was calculated to be less than 1 rad, and was, therefore, unlikely to harm the fetus [6,7]. After 7 years of follow-up, the growth and development of this child were found to be normal [8,9]. We do not suggest any radiologic examination be arranged at any time during pregnancy, even if the dose is within the safe range. However, if it is indicated or inadvertently performed, preserving the pregnancy should first be considered, as long as the radiation dose is below the 5-rad limit.

References

1. Siegler AM. Hysterosalpingography. *Fertil Steril* 1983;40:139-58.
2. Jongen VH, Collins JM, Lubbers JA, van Selm M. Unsuspected early pregnancy at hysterosalpingography. *Fertil Steril* 2001;76:610-1.
3. Justesen P, Rasmussen F, Andersen PE Jr. Inadvertently performed hysterosalpingography during early pregnancy. *Acta Radiol Diagn (Stockh)* 1986;27:711-3.
4. Cheung GW, Lok IH, Wong A, Yip SK. Unsuspected pregnancy at hysterosalpingography: a report of three cases with different outcomes. *Hum Reprod* 2003;18:2608-9.
5. Stadtmauer L, Grunfeld L. The significance of endometrial filling defects detected on routine transvaginal sonography. *J Ultrasound Med* 1995;14:169-72.
6. Osei EK, Faulkner K. Fetal doses from radiological examinations. *Br J Radiol* 1999;72:773-80.
7. Werner A, Wechsler O, Stahl-Kent V, Apostoleris A. Radiation doses during hysterosalpingography: implications in early pregnancy. *Isr J Med Sci* 1986;22:468-9.
8. Kaufman AS. Seven steps for interpreting the WISC-III profile: from IQs to factor indexes to scaled scores. In: *Intelligence Testing with the WISC-III*. New York: John Wiley & Sons, 1994: 97-132.
9. Prifitera A, Dersh J. Base rates of WISC-III diagnostic subtest patterns among normal, learning-disabled and ADHD samples. In: Bracken BA, McCullum RS, eds. *Journal of Psychoeducational Assessment Monograph Series. Advances in Psychoeducational Assessment: Wechsler Intelligence Scale for Children*, 3rd edition. Germantown, TN: Psychoeducational Corporation, 1993:43-55.