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Hysterosalpingography

TECHNIQUES & INTERPRETATION

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Robert B. Hunt ▼ Alvin M. Siegler

NEE FOR RESALE

Hysterosalpingography: Techniques and Interpretation

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This book is dedicated to

John A. Twaddle, M.D.

(1913–1986)

*Former Chief of Radiology, Gynecology
Division*

*Brigham and Women's Hospital
Boston*

*An accomplished scientist, a compassionate
physician, and a dear friend.*

and

Louis M. Hellman, M.D.

Professor Emeritus

*Department of Obstetrics and Gynecology
State University of New York*

Health Science Center at Brooklyn

An inspiring teacher and a scholar.



FOREWORD



Hysterosalpingography is a technique which has proved to be one of the most useful procedures in diagnostic gynecology. The fact that it has survived the test of time attests to its value. Despite the development of numerous other technologies to evaluate the uterine cavity and fallopian tubes, including laparoscopy and lavage, hysteroscopy, and tuboscopy, as well as imaging techniques such as ultrasonography and magnetic resonance imaging, hysterosalpingography stands in a class of its own for its simplicity, safety, versatility, relatively low cost, and provision of valuable information about the contour of the uterine cavity and tubal lumina.

The procedure needs to be appreciated by both gynecologist and by radiologist. Working in conjunction with one another, these two disciplines have made refinements in technique which add to the advantage of hysterosalpingography.

Three pioneers, I. C. Rubin, Samuel Rozin, and Alvin Siegler, provided much of the basis for the success of diagnostic hysterosalpingography and have long advocated its practical applications for gynecologists. As an extension of his infertility practice, Dr. Siegler has had a long-standing interest in hysterosalpingography. His work

in this area dates back 25 years, when he first published on radiologic studies of tuberculous salpingitis, and includes his classic text, *Hysterosalpingography*, published in 1967 with a second edition in 1974.

Robert B. Hunt, author of the *Atlas of Female Infertility Surgery*, also has many years of experience with hysterosalpingography. Now, Robert Hunt and Alvin Siegler have joined forces to create this authoritative text, tracing hysterosalpingography from its historical rudiments to its current place in modern day gynecology and emphasizing its practical applications.

In the last sentence of his foreword to Dr. Siegler's earlier book, Louis M. Hellman, the eminent educator in the field of obstetrics and gynecology, crystallized the significance of the procedure to which the text was devoted. His comment, "I have learned a great deal from careful reading of this volume", is as simple as the procedure of hysterosalpingography. It sums up the book as well as the dual role of the educator as teacher and student. I am pleased to echo those sentiments.

Hysterosalpingography: Techniques and Interpretation will be the new gold standard in its field.

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PREFACE

After more than half of a century, the carefully performed and properly interpreted hysterosalpingogram (HSG) remains a basic diagnostic test for many gynecologic problems. This procedure continues to require periodic assessment and evaluation to define its role in gynecology. We believe that it is often the first clue to the presence of intrauterine disease and abnormalities of the fallopian tubes. Despite its continued use, however, there remains a need for clarification and amplification of many of the abnormal findings. Because too many HSGs are technically unsatisfactory or poorly interpreted, we feel justified in offering our suggestions to improve skills in performance and interpretation.

A brief description of the evolution of the procedure is given, with emphasis on the contemporary relevance of hysterosalpingography, information concerning minimal radiation exposure for optimal observation of the contrast material, the preferred type of radiographic equipment, and the various techniques currently employed to perform the test.

Since a simplified, minimally painful procedure is essential for consistent reproducible results, we have carefully described our technique, noting the approaches that can give technically superior HSGs. We believe that television fluoroscopy with image intensification is indispensable for selecting the propitious moment for taking the films. Sequelae do occur, but they are uncommon. In an effort to limit the untoward effects, the types of problems and methods to avoid them are cited.

Very often, the initial clue to the existence of a congenital uterine anomaly is the presence of a deformed uterine cavity seen on the HSG. Several types are described, and compared with hysteroscopic and laparoscopic appearances. A section is devoted to a discussion of the hystero-graphic changes in the uterine cavity of diethylstilbestrol-exposed women.

One of the most common filling defects seen on the HSG is caused by uterine synechiae. Their radiographic

shadows have been classified and correlated with hysteroscopic findings.

Polyps and myomas cause intrauterine filling defects that often create characteristic hystero-graphs. Although their precise location within the cavity and their size can not be ascertained by HSG, such tumors are often discovered initially during the investigation of causes of abnormal uterine bleeding. Adenomyosis and endometrial hyperplasia are not easily recognized on the hystero-graph, but certain findings make one suspect their presence.

Several medical centers use the hystero-graph as a part of the work-up for patients with postmenopausal uterine bleeding. The controversy concerning the potential risks of disseminating malignant cells is discussed, and some of the characteristic intrauterine shadows caused by adenocarcinoma are depicted.

Findings on the HSG are often the initial clue to the existence of tubal causes of infertility, and this procedure remains a valuable diagnostic method for detecting tubal obstructions. Selected ostial salpingography can detect tubal spasm, "blow" out inspissated debris, and overcome certain types of obstruction in the proximal tubal segment.

The normal ampulla casts characteristic shadows on the salpingogram after filling with contrast material. The lack of luminal folds in conjunction with distal tubal obstruction has significant clinical and prognostic implications. Some of these radiographic findings are compared with those seen at laparoscopy and at laparotomy.

Specific types of tubal abnormalities are caused by salpingitis isthmica nodosa and tuberculous salpingitis, so each of these entities is discussed in a separate chapter. Although uterine and tubal fistulas are rare clinical findings, they have been described on the HSG. Their detection and precise localization are aided by the radiographic findings so that appropriate treatment can be carried out.

In the last section, HSG reveals the results of various tubal sterilizations. In many instances it is an essential

diagnostic test prior to an attempt to reverse one of these procedures.

The HSG has a limited role in the management of occult IUDs because of advances in operative hysteroscopy. Nevertheless certain types of IUDs cause characteristic radiographic shadows, and these pictures are compared with their intrauterine position seen hysteroscopically.

Inadvertently, HSGs have been performed in pregnant patients; the intrauterine filling defects and the response of the myometrium create a characteristic appearance. In that chapter, studies of the lower uterine segment, including the incompetent cervical os and cesarean scar, are included. Although of only historic interest, HSGs in the presence of an abdominal pregnancy, tubal pregnancy, and hydatidiform mole are shown.

The numerous illustrations should enable clinicians to locate an example of almost any variation of the HSG. Although the book is designed principally as an atlas, the authors have provided a background of relevant gynecologic information in each chapter. Illustrations have been borrowed from generous colleagues in order to

make the presentation as complete as possible. In many conditions we have compared direct endoscopic findings with indirect radiographic observations.

With the advent of modern diagnostic, gynecologic endoscopic techniques and ultrasonography, why continue to use the HSG? The HSG remains a nonoperative, simple, relatively painless screening procedure that outlines the lumina of the uterine cavity and the fallopian tubes. Indeed, when it is normal, it is unusual to find any significant intrauterine lesions at hysteroscopy. With normal fill and spill from both fallopian tubes, it is uncommon to find significant tubal disease. Salpingography has limitations, however; principally, in its inability to detect periadnexal adhesions or significant endometriosis.

The authors hope that this book will serve both the radiologist and gynecologist. The book is based on clinical material collected from thousands of HSGs reviewed by us, collectively, over 50 years of special interest with this procedure. To bring this subject up to date, the literature that has appeared on hysterosalpingography during the last decade has been reviewed and some of these findings have been incorporated into the text.

ROBERT B. HUNT, M.D.

ALVIN M. SIEGLER, M.D., D.Sc.

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Without the kind assistance of many individuals, this book would never have come to fruition. We would like especially to thank Ms. Sarah Jeffries and Leon Chesley, Ph.D., for improving our manuscript through their careful editing. Jean Kanski-Bitt created all of our original drawings. John Buckley produced most of the prints and did not hesitate to take time from his schedule to pick up the endless stream of additions. The prints were air-brushed by Ron Kyle. The photographs of instruments that appear in the book were made by Jim Green.

Our secretaries, Sandy Adams and Mary Sierra, coordinated the many necessary tasks that result from dual authorship. We deeply appreciate the encouragement of Ms. Nancy Puckett and Year Book Medical Publishers for their confidence in our project.

Of great inspiration has been the patience of our families, especially our wives, Marcia Siegler and Kate Hunt. Jamie Hunt and Eliza and Jesse Lane must also be acknowledged for their special assistance.

ROBERT B. HUNT, M.D.

ALVIN M. SIEGLER, M.D., D.Sc.

COLOR PLATES





PLATE 1.—Right unicornuate uterus at laparoscopy (see also Fig 4-3).



PLATE 2.—Left unicornuate uterus and a rudimentary right uterine horn at laparoscopy (see also Fig 4-3).



PLATE 3.—Left unicornuate uterus at laparoscopy with a functional but noncommunicating right uterine horn in a 14-year-old girl (see also Fig 4-6).

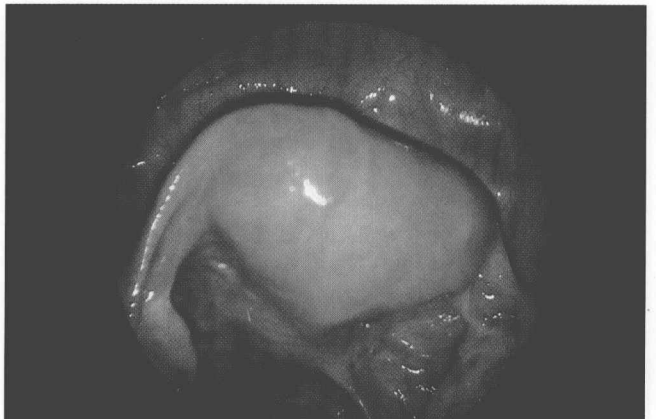


PLATE 4.—Uterus didelphys with fused uterine horns (see also Fig 4-8).

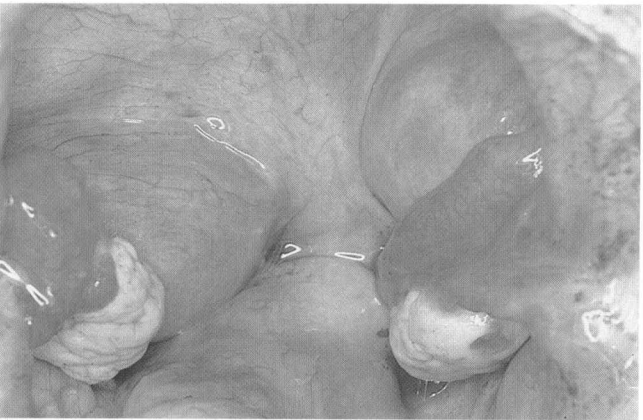


PLATE 5.—Bicornuate uterus has widely separated uterine horns (see also Fig 4-10).



PLATE 6.—Hysteroscopic view of a uterine septum (see also Fig 4-14).

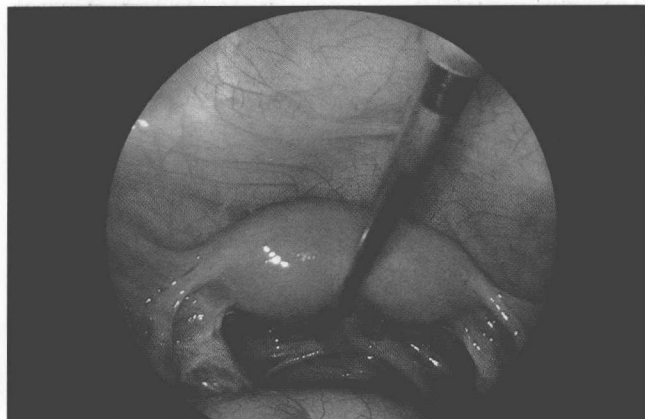


PLATE 7.—Laparoscopic view in the same patient as in Plate 6 shows an intact serosal surface (see also Fig 4-14).

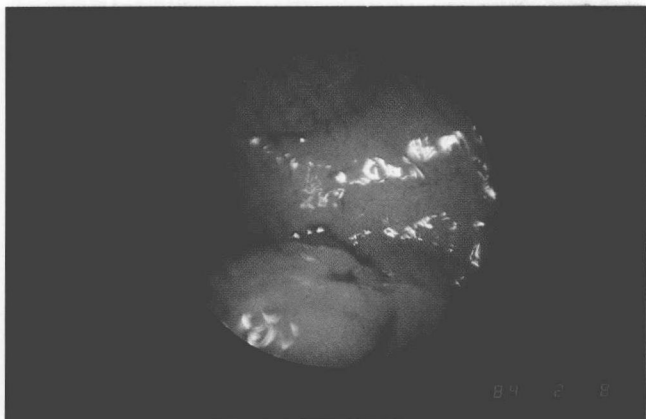


PLATE 8.—Hysteroscopic view of endometrial polyps (see also Fig 5-3).

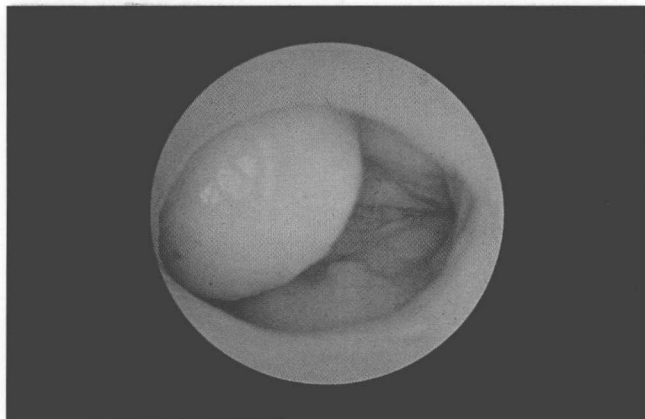


PLATE 9.—Hysteroscopic view of submucous myoma (see also Fig 5-13).

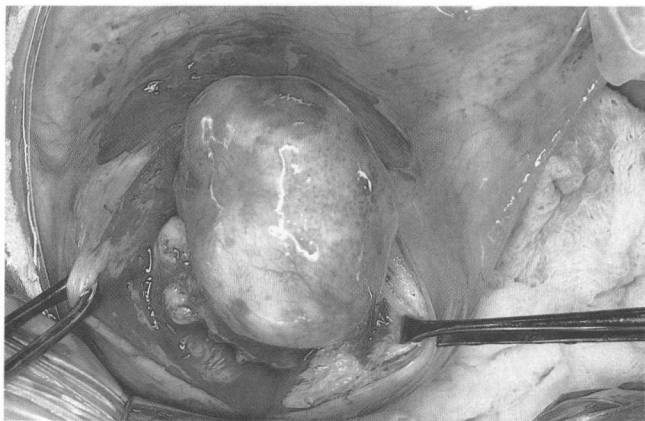


PLATE 10.—Large submucous myoma seen at hysterotomy (see also Fig 5-14).

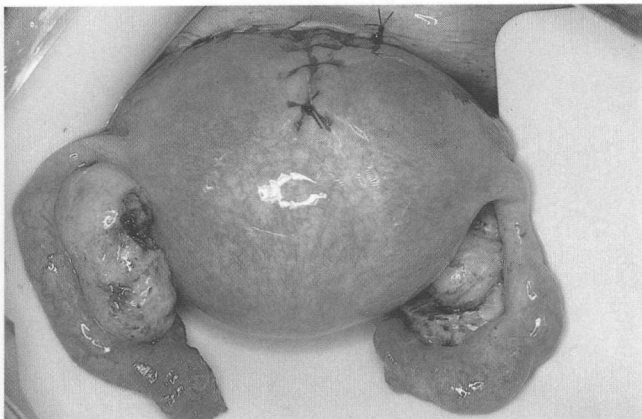


PLATE 11.—The uterus in Plate 10 after repair.



PLATE 12.—Large intramural myoma (see also Fig 5-6).



PLATE 13.—Laparoscopic view of a pedunculated myoma (see Fig 5-6).

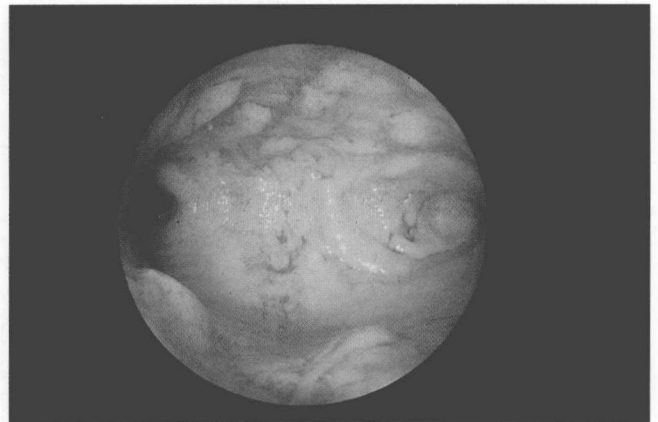


PLATE 14.—Hysteroscopic view of endometrial hyperplasia (see also Fig 5-28).

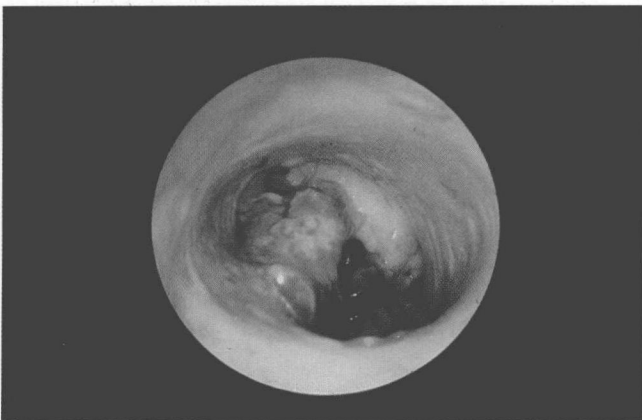


PLATE 15.—Hysteroscopic view of endometrial carcinoma (see also Fig 5-31).

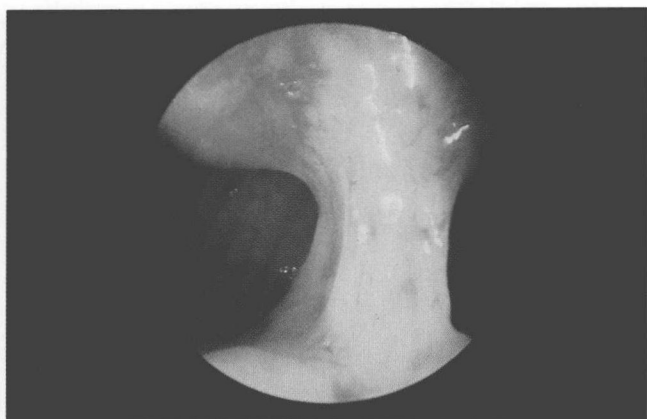


PLATE 16.—Intrauterine synechiae (see also Fig 6-9).



PLATE 17.—Mild intrauterine synechiae (see also Fig 6-10).

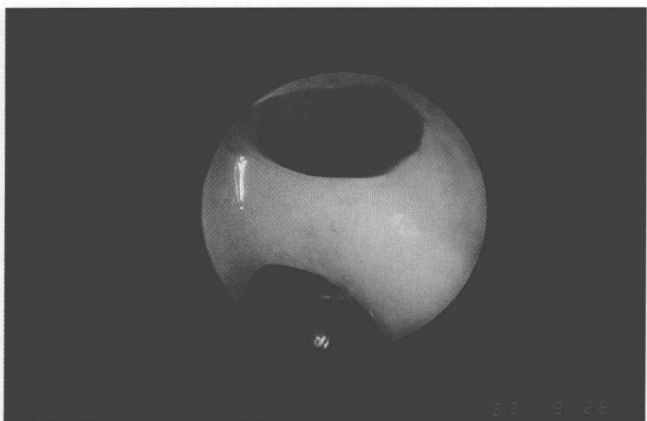


PLATE 18.—Hysteroscopic view of mild intrauterine synechiae (see also Fig 6-11).

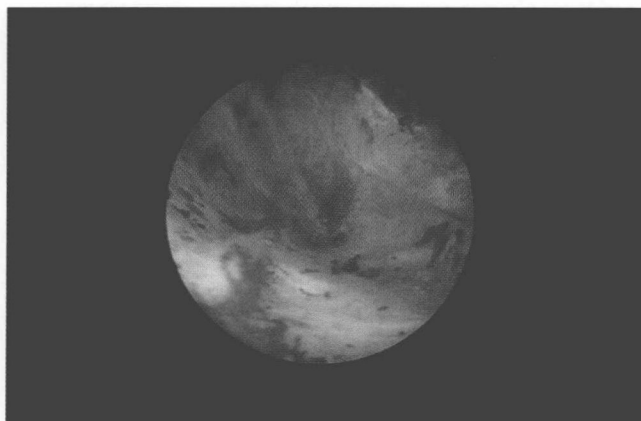


PLATE 19.—The uterine cavity after hysteroscopic lysis of intrauterine synechiae (see also Fig 6-15).

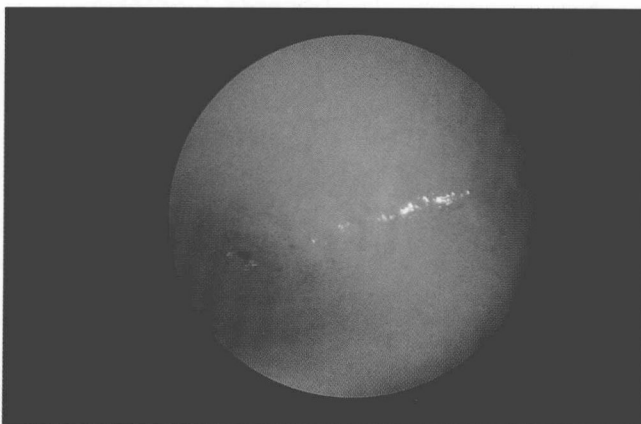


PLATE 20.—Hysteroscopy of a normal tubal ostium (see also Fig 7-1).

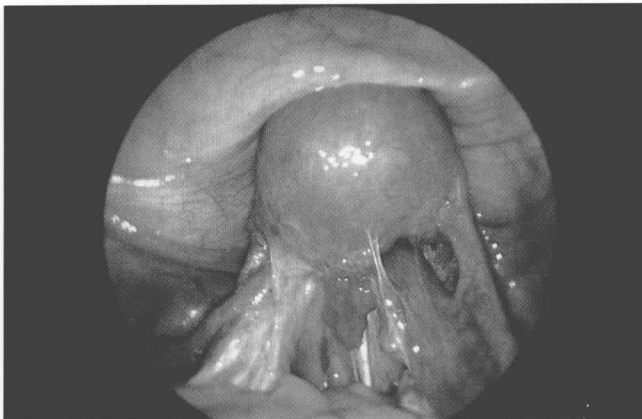


PLATE 21.—Laparoscopic view of severe postoperative pelvic adhesions (see also Fig 7-22).



PLATE 22.—Laparotomy view after a right tubal anastomosis.



PLATE 23.—Laparotomy view after a right tubal implant (see also Fig 7-19).

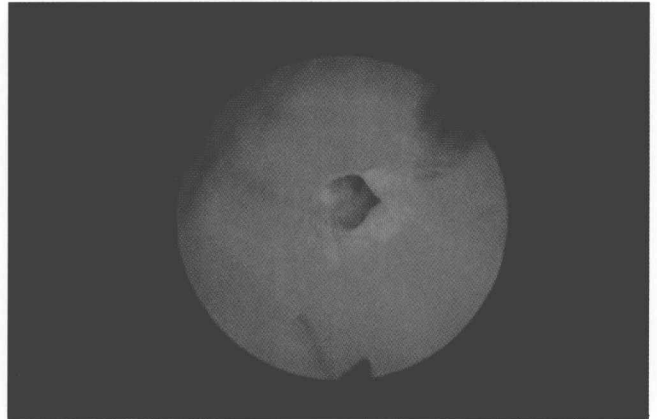


PLATE 24.—Hysteroscopic view of uterotubal ostium after tubal implantation (see also Fig 7-19).



PLATE 25.—Bilateral hydrosalpinges (See also Fig 7-24).

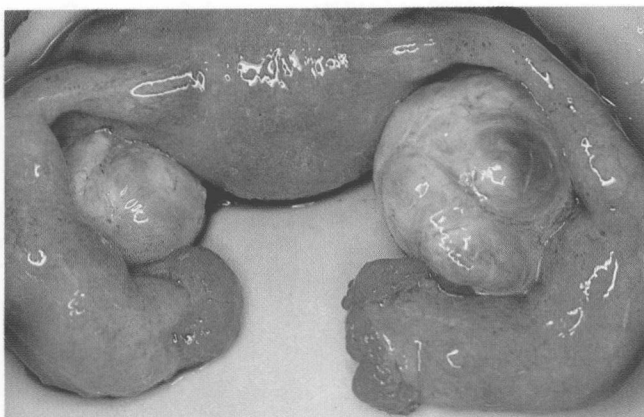


PLATE 26.—Bilateral salpingostomies of patient in Plate 25.



PLATE 27.—Normal ampullary tubal mucosa seen at salpingoscopy (see also Fig 7-29). (Courtesy of Cameron Nezhat, M.D., Atlanta.)

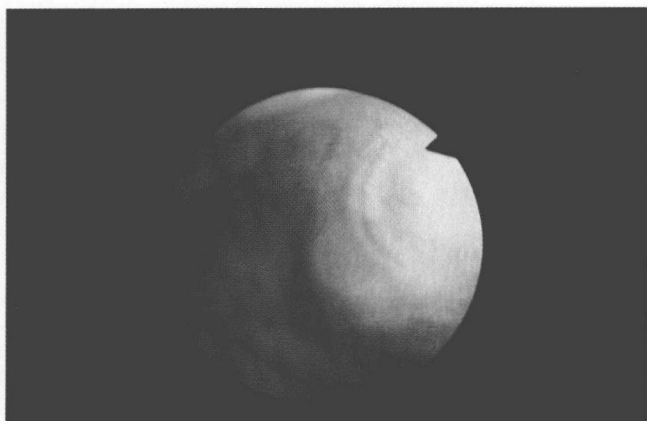


PLATE 28.—Abnormal ampullary tubal mucosa seen at salpingoscopy (see also Fig 7-30). (Courtesy of Cameron Nezhat, M.D., Atlanta.)

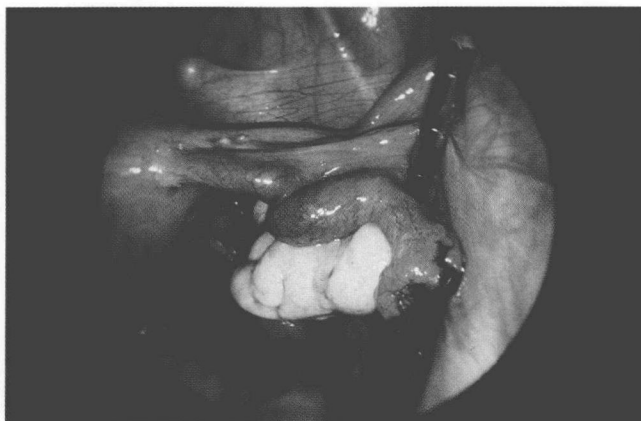


PLATE 29.—Laparoscopic view after a right cornual anastomosis.

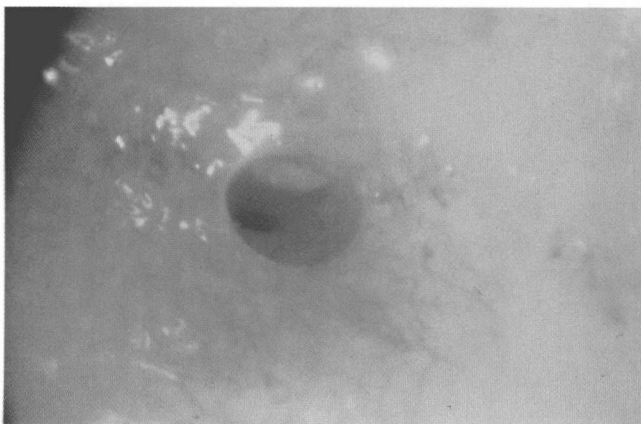


PLATE 30.—Hysteroscopic view of a cornual polyp (see also Fig 7-42).

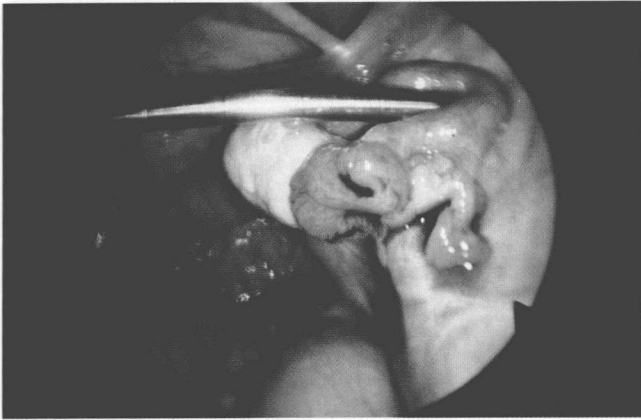


PLATE 31.—An accessory fimbrial stalk of the right tube is seen at laparoscopy (see also Fig 7-43).



PLATE 32.—Laparotomy view of a left ovarian endometrioma.



PLATE 33.—Bilateral salpingitis isthmica nodosa and distal tubal obstructions (see also Fig 9-4).



PLATE 34.—Hulka clips were applied to both tubes (see also Fig 11-13).



PLATE 35.—View after removal of Hulka clips and tubal anastomosis (same patient as in Plate 34).



PLATE 36.—Embedded Lippes loop was detected at laparoscopy (see also Fig 12-8).

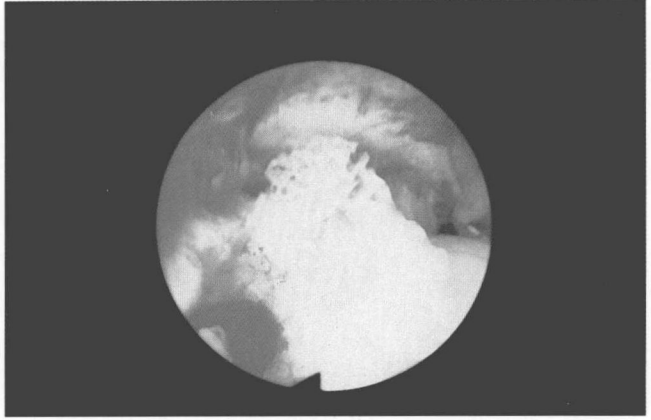


PLATE 37.—Hysteroscopic view of products of conception in a patient with a missed abortion (see also Fig 13-7).

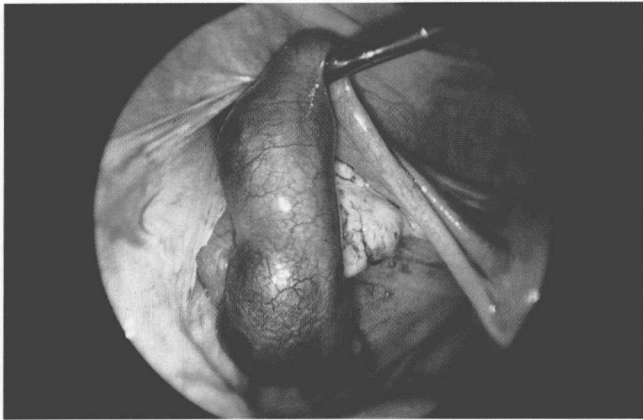


PLATE 38.—Laparoscopic view of a left ampullary pregnancy (see also Fig 13-11).



PLATE 39.—Laparotomy view of a left cornual pregnancy (see also Fig 13-15).

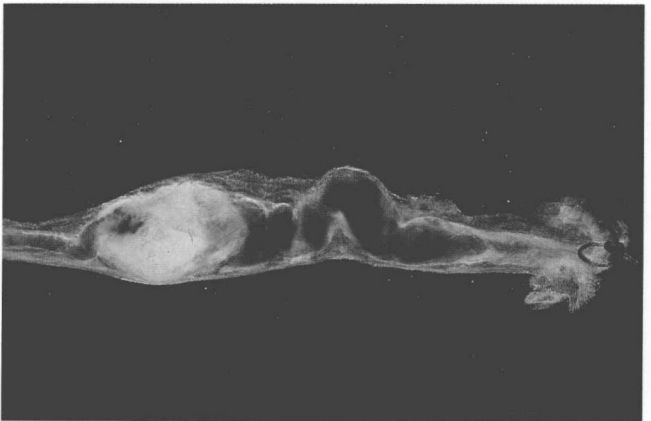


PLATE 40.—Proximal ampullary pregnancy in a tube fixed with special stains (see also Fig 13-16). (Courtesy of Carlton Eddy, Ph.D., San Antonio, Tex.).