tion, and it was after the third operation that he developed the massive hepatic necrosis which was responsible for his death. Case 6 had an episode of hypotension during her second operation, but this is unlikely to have been the cause of her liver necrosis since she did not develop renal failure at the same time. The finding of mitochondrial immunofluorescent antibody in her serum also supports the diagnosis of halothane hepatitis^{5 16}.

The rarity of liver damage following halothane is explicable on the assumption that it is a hypersensitivity reaction occurring only in certain predisposed subjects. Evidence for an immunological pathogenesis is its relationship to multiple rather than single exposures; the earlier onset of second and subsequent attacks; the association of fever; the frequent finding of circulating and tissue eosinophilia; and in many cases the presence of mitochondrial antibodies. Direct evidence in favour of a cell-mediated immune mechanism has been obtained by Paronetto and Popper,¹⁷ who found that lymphocytes from affected patients underwent transformation in vitro when halothane was used as the antigen.

At present halothane is the most widely used general anaesthetic. Though its desirable properties outweigh the small risk of liver damage, we would suggest that its use could be made even safer and that the occurrence of hepatic necrosis could be largely prevented, for it only occasionally occurs after a single anaesthetic. Twenty-seven of the 35 patients of Trey and his colleagues,¹⁵ 30 of the 42 patients reported by Klion and his colleagues,⁵ and all of our patients had two or more anaesthetics with halothane before developing massive hepatic necrosis. Furthermore, all but one of our patients had clinical features—jaundice, fever, or both—after earlier anaesthetics which could have alerted to the possibility of halothane hepatotoxicity and prevented further exposure. For example, one of our patients (Case 9) required two further operations a year after her attack of hepatitis, but agents other than halothane were used for anaesthesia and neither of the operations was complicated by fever or jaundice.

Multiple halothane anaesthetics should not be given within a short period of time without a careful study of the previous postoperative course. Though fever during the first few days after major surgical procedures is common, unexplained fever—particularly if lasting longer than five days or occurring following an afebrile interval after operation¹⁸—should be a deterrent to its further use. However, temperature charts are often discarded after the patient's discharge from hospital and anaesthetic records are usually kept on separate forms, which often become separated from the case folder. Furthermore, the important preoperative examination of the patient by the anaesthetist is still sometimes omitted. For these reasons we believe that halothane hepatitis is a definite entity, that its frequency is higher than currently accepted, and that most cases could be prevented.

References

- 1 Burnap, T. K., Galla, S. J., and Vandam, L. D., *Anesthesiology*, 1958, **19**, 307.
- 2 Virtue, R. W., and Payne, K. W., *Anesthesiology*, 1958, **19**, 562.
- 3 Mushin, W. W., Rosen, M., Bowen, D. J., and Campbell, H., *British Medical Journal*, 1964, **2**, 329.
- 4 Committee on Anesthesia, National Academy of Sciences and National Research Council, *Journal of the American Medical Association*, 1966, **197**, 775.
- 5 Klion, F. M., Schaffner, F., and Popper, H., *Annals of Internal Medicine*, 1969, **71**, 467.
- 6 Tygstrup, N., *Lancet*, 1963, **2**, 466.
- 7 Hughes, M., and Powell, L. W., *Gastroenterology*, 1970, **58**, 790.
- 8 Belfrage, S., Ahlgren, I., and Axelsson, S., *Lancet*, 1966, **2**, 1466.
- 9 Klatskin, G., and Kimberg, D. V., *New England Journal of Medicine*, 1969, **280**, 515.
- 10 Trey, C., Lipworth, L., and Davidson, C. S., *Gastroenterology*, 1970, **58**, 306.
- 11 Stephen, C. R., *New England Journal of Medicine*, 1969, **280**, 561.
- 12 Lorhan, P. H., *New England Journal of Medicine*, 1969, **280**, 562.
- 13 Allen, H. L., *New England Journal of Medicine*, 1969, **280**, 562.
- 14 Doniach, D., Riott, I. M., Walker, J. G., and Sherlock, S., *Clinical and Experimental Immunology*, 1966, **1**, 237.
- 15 Trey, C., et al., *New England Journal of Medicine*, 1968, **279**, 798.
- 16 Rodriguez, M., Paronetto, F., Schaffner, F., and Popper, H., *Journal of the American Medical Association*, 1969, **208**, 148.
- 17 Paronetto, F., and Popper, H., *New England Journal of Medicine*, 1970, **283**, 277.
- 18 Klion, F. M., Schaffner, F., and Paronetto, F., *Gastroenterology*, 1969, **56**, 409.

Hospital Topics

Minor Gynaecological Outpatient Operations

H. WAGMAN, D. S. BAMFORD

British Medical Journal, 1971, **1**, 450–451

Summary

Altogether 143 patients had minor gynaecological operations performed under general anaesthesia in the outpatient department. This method proved to be very acceptable to patient, gynaecologist, and anaesthetist. No complications occurred requiring admission to hospital, and the short recovery time confirmed the safety of early discharge from hospital. This

procedure had a beneficial effect on the waiting list, and expensive beds were used more efficiently for major surgical cases. It is recommended that this procedure should be more widely practised, provided that the patients are adequately screened.

Introduction

Limited numbers of beds, restricted theatre time, and increasing work load are common problems in gynaecological departments of many hospitals at a time when the cost of inpatient care is rising steeply. In this teaching hospital the waiting list has been lengthened by the closure of an annexe, so that only urgent and acute cases can be promised early admission.

Obstetric and Gynaecological Unit, the London Hospital, London E.1
H. WAGMAN, F.R.C.S.ED., M.R.C.O.G., Registrar
D. S. BAMFORD, F.R.C.S.ED., M.R.C.O.G., Senior Registrar

Ironically now, when much of the increased work load stems from the Abortion Act 1967, the patients whose admission is most often deferred are those complaining of sterility. But the introduction of anaesthetic agents with short recovery times now permits most minor gynaecological procedures, including the investigation of infertility, to be carried out on an outpatient basis.

Materials and Methods

From March 1969 selected patients have been offered curettage and other minor procedures as outpatients. Those selected are under 40 and in good general health, without any complicating disease and with a good command of English. All patients selected for outpatient operation have a full medical history taken, and tests of blood pressure, urine, blood count, and chest x-ray film. A suitable operation date is selected and they are given printed instructions to come to hospital "starved" and accompanied by a friend or relative. If the presenting symptom is infertility it is ensured that semen analysis gives acceptable results before the final arrangements are made.

On arrival at hospital the patient is examined by a senior anaesthetist, who also reviews the medical history. The gynaecologist interviews the patient and reviews the menstrual history. Anaesthesia is induced, with the patient in the lithotomy position, by means of either halothane or intravenous propanidid, and it is maintained with one of these together with nitrous oxide and oxygen. Premedication is not given. Perineal toilet is performed and sterile drapes are applied. The vulva is not shaved. Pelvic examination is carried out and the relevant procedure performed. In the infertile patient tubal insufflation is done, followed by dilatation of the cervix and full curettage. After operation the patients remain under observation and the recovery rates are assessed objectively. A letter is sent to the general practitioner with details of the procedure performed, adding that the patient should be sent to the hospital emergency department if any complication arises. Questionnaires are sent to the patients later to inquire about any ill effects and to gauge their reaction to the operation.

Results

From March 1969 until October 1970 inclusive 143 patients had outpatient operations under general anaesthesia. No untoward effects have developed and no patient has required admission. On no occasion has a general practitioner been obliged to refer a patient back to the emergency department. Most of these patients were infertile, and tubal insufflation and curettage were performed. Four patients were suffering from dysfunctional bleeding, two underwent dilatation of the introitus for non-consummation, one had a polypectomy, and one a cystoscopy. As a result of the preoperative screening two patients were found to have moderate anaemia requiring treatment (haemoglobin 8.5 g/100 ml) and one had emphysematous changes on the chest x-ray film. None of these had been suspected on clinical grounds.

Outpatient curettage has proved eminently acceptable to the patients. Side effects were confined to mild abdominal discomfort in the immediate postoperative period, or short-lived vomiting, but both were infrequent. In all cases the patient was fully recovered within half an hour and left hospital within two hours. Questionnaires have disclosed no subsequent ill effects.

Discussion

It is wasteful of services and money to devote inpatient care to patients requiring only minor gynaecological procedures,

and it is logical to extend the use of outpatient operating facilities (Frampton, 1970). This can be done with no anaesthesia, local anaesthesia, or general anaesthesia.

For many years we have performed hysterosalpingography and superficial cervical cautery without anaesthesia and endometrial biopsy under paracervical block. The operating conditions are far from ideal, and many patients find the experience distressing (Littlepage *et al.*, 1969). In some apprehensive nulliparous patients instruments cannot be introduced into the cervical canal without general anaesthesia. In one report patients were specially selected for their suitability for curettage under paracervical block, but even so the operation had to be abandoned in four out of 110 patients, and only 91 found the conditions acceptable (Littlepage *et al.*, 1969). Holt (1970) has reported on the use of the Vabra aspiration curette. Out of 70 patients the technique failed in six, and 37 experienced severe or moderate discomfort.

If general anaesthesia is used the patients may be accommodated in an outpatient clinic or in a day-bed unit (Shields, 1969; Craig, 1970). The anaesthetic agents must be short-acting; hence we have not employed thiopentone (Dundee, 1956) but have used nitrous oxide and oxygen, together with either halothane or intermittent intravenous propanidid. Recovery times were assessed by flicker fusion, Romberg's test, and the patient's capacity to perform various intricate tests. These studies have confirmed rapid recovery. Even so, we insist that the patient is accompanied by a responsible companion and does not drive a car or operate dangerous machinery for 24 hours after operation.

We have found that patients accept outpatient operation readily. Firm arrangements can often be made when the patient first attends the outpatient clinic for consultation. That the time spent at hospital is a matter of hours not days is particularly appreciated by women who are working or have family commitments. The experience is not distressing, so that if further operation is necessary they accept it willingly, unlike many patients who have been operated on under paracervical block. The operating conditions are good. The general anaesthesia permits full pelvic examination, and this resulted in the detection of a pelvic mass which had not previously been felt in one infertile patient; an endometriotic cyst was subsequently removed at laparotomy. Full curettage is permitted, and many other procedures can be carried out as indicated—for example, cystoscopy, tubal insufflation, polypectomy. The saving in cost is an attractive administrative aspect (Ballard, 1969). The instruments required when this pilot scheme was instituted cost, at a conservative estimate, £200; this includes a kymograph. The inpatient management of these cases would have cost, at a conservative estimate, £2,000. Our thanks are due to the consultant staff of the obstetric and gynaecological unit of the London Hospital for their permission to report on patients under their care, and to the consultants, sister, and nursing staff of the department of urology for their willing co-operation. Winthrop Laboratories kindly supplied the propanidid (Epontol) and apparatus used to assess recovery times.

References

- Ballard, L. A. (1969). *American Journal of Obstetrics and Gynecology*, **104**, 812.
- Craig, G. A. (1970). *British Medical Journal*, **2**, 786.
- Dundee, J. W. (1956). *Thiopentone and Other Thiobarbiturates*. Edinburgh, Livingstone.
- Frampton, J. (1970). *Journal of Obstetrics and Gynaecology of the British Commonwealth*, **77**, 95.
- Holt, E. M. (1970). *Journal of Obstetrics and Gynaecology of the British Commonwealth*, **77**, 1043.
- Littlepage, B. N. C., Daniel, D. G., Ahmad, S., and Turnbull, A. C. (1969). *Journal of Obstetrics and Gynaecology of the British Commonwealth*, **76**, 163.
- Shields, L. V. (1969). *American Journal of Obstetrics and Gynecology*, **104**, 809.