

probably more reliable than ultrasonography in deciding who needs an evacuation of retained products: of 507 scans performed seven days after a medical abortion, 47 suggested retained products, but only nine of these women needed admission.²

Mifepristone also seems effective in reducing the physical and emotional trauma of abortion in the second trimester, whether performed under the Abortion Act⁸ or for intrauterine death.⁹ It greatly reduces the time that elapses between the administration of vaginal gemeprost and abortion, making this possible within a day care setting.

Both the Royal College of Obstetricians and Gynaecologists and the Birth Control Trust have recently published their recommendations for unplanned pregnancies.^{7, 10} The scarcity of theatre time is one of the important limiting factors in

providing an adequate abortion service, and, on average, medical abortions require substantially less time in theatre than surgical abortions. They are, however, more labour intensive, and although financial savings have been suggested, no rigorous economic evaluation has yet been performed.

MICHAEL HEARD

Senior Registrar,
Department of Obstetrics and Gynaecology,
University College Hospital,
London WC1E 6AU

JOHN GUILLEBAUD

Medical Director,
Margaret Pyke Centre for Study and
Training in Family Planning,
London W1V 5TW

1 Guillebaud J. Medical termination of pregnancy. *BMJ* 1990;303:352-4.

2 UK Multicentre Trial. The efficacy and tolerance of mifepristone and prostaglandin in first trimester termination of pregnancy. *Br J Obstet Gynaecol* 1990;97:480-6.

3 Silvestre L, Dubois C, Renault M, Rezvani Y, Baulieu E, Ulmann A. Voluntary interruption of pregnancy with mifepristone (RU486) and a prostaglandin analogue. *Lancet* 1990;335:645-8.

4 Urquhart DR, Templeton AA. Psychiatric morbidity and acceptability following medical and surgical methods of induced abortion. *Br J Obstet Gynaecol* 1991; 98: 396-9.

5 Mackenzie IZ. The potential effects on NHS resources. In: Williams C, ed. *The abortion pill*. London: Birth Control Trust, 1990:41-7.

6 Roussel Laboratories. *Data Sheet. Mifegyne tablets (mifepristone)*. Uxbridge, Middlesex: Roussel Laboratories, 1991.

7 Birth Control Trust. *NHS abortion and RU486/gemeprost*. London: Birth Control Trust, 1991.

8 Hill NCW, Selinger M, Ferguson J, Lopez-Bernal A, Mackenzie IZ. The physiological and clinical effects of progesterone inhibition with mifepristone (RU486) in the second trimester. *Br J Obstet Gynaecol* 1990;97:487-92.

9 Cabrol D, Dubois C, Cronje H, Gennet JM, Guillot M, Maria B, et al. Induction of labour with mifepristone (RU486) in intrauterine death. *Am J Obstet Gynecol* 1990; 163: 540-1.

10 Working Party of the Royal College of Obstetricians and Gynaecologists. *Report on unplanned pregnancy*. London: RCOG, 1991.

Hepatocellular carcinoma

Referral to a specialist centre is recommended

Worldwide, hepatocellular carcinoma is responsible for at least one million deaths a year.¹ More than half the patients with this tumour also have cirrhosis of the liver, and this makes the treatment more difficult.² Most patients die untreated.

The outlook, however, could be improved. Early diagnosis offers the best chance of cure, and careful monitoring of patients with chronic liver disease, particularly cirrhosis, has made it possible to detect hepatocellular carcinomas at an early stage.^{3, 4} The five year survival rate after surgical resection varies from 30% to 50%, depending on the proportion of asymptomatic or small cancers and how many patients also have cirrhosis.^{3, 5} Tang *et al* found that five year survival after resection was 85% for those with tumours less than 2 cm in diameter but only 60% for those with tumours of 4.1-5.0 cm.⁶ The prognosis of patients with a solitary, small hepatocellular carcinoma in a healthy liver is good.⁷ Nagasue *et al* showed that in patients with hepatocellular carcinoma the four year survival rate was 80% in those without cirrhosis but 35% in those with cirrhosis.⁸

Untreated, the natural course of patients with even small liver cancers (less than 3 cm in diameter and asymptomatic) is poor. A study of 22 patients found that only three were alive three years after the tumour was detected.⁹ Among 12 patients who died the cause of death in five was variceal bleeding rather than advanced cancer. In the seven patients who died of massive cancer the tumours grew rapidly, and invasion of the portal vein by cancer was shown by ultrasonography in four.

The results of any treatment should be set against this figure of 13% survival at three years. For example, surgical resection of cancers of the liver as small as 3 cm gave a four year survival rate of 59%—a figure that has validated the operation.¹⁰ Small and encapsulated hepatocellular carcinoma is nowadays being both diagnosed and treated throughout the world.^{5, 11}

In the 1980s liver surgery became both safer and more widely practised—mainly because of technical advances.^{12, 13} The treatment of patients with hepatocellular carcinoma and cirrhosis remains difficult to decide. Those with adequate biochemical liver function are usually good candidates for surgery.¹⁴ Perioperative mortality and morbidity seem to depend on the volume of operative blood loss and the extent of the resection.

Follow up studies have shown that the main hazard after resection of hepatocellular carcinoma is intrahepatic recurrence; rates may be 50% or more within one to two years of operation.¹⁵⁻¹⁷ Recurrent tumours (and primary tumours that cannot be resected) may be treated by transcatheter arterial embolisation,¹⁸ targeted chemotherapy,¹⁹ or percutaneous injection of alcohol.^{20, 21} These treatments have improved the prognosis in patients with recurrent disease.²² Patients with hepatocellular carcinoma less than 3 cm treated by ultrasonographically guided percutaneous injection of alcohol at one Japanese unit had a five year survival rate of 48%.²³

The results of liver transplantation for hepatocellular carcinoma have been disappointing,²⁴⁻²⁶ but those for end stage cirrhosis with incidental malignancy are much better.²⁴ The best advice for a patient with the disease is to be referred to a specialist centre staffed by surgeons and physicians who are familiar with hepatocellular carcinoma.

T EZAKI

Assistant Professor,
Second Department of Surgery, School of Medicine,
University of Occupational and Environmental Health,
Kitakyushu 807,
Japan

1 Rustgi VK. Epidemiology of hepatocellular carcinoma. *Ann Intern Med* 1988;108:390-1.

2 Kew MC, Popper H. Relationship between hepatocellular carcinoma and cirrhosis. *Semin Liver Dis* 1984;4:136-46.

3 Lee CS, Sung JL, Hwang LY, Sheu JC, Chen DS, Lin TY, et al. Surgical treatment of 109 patients with symptomatic and asymptomatic hepatocellular carcinoma. *Surgery* 1986;99:481-90.

- 4 The Liver Cancer Study Group of Japan. Primary liver cancer in Japan. *Ann Surg* 1990;211:277-87.
- 5 Nagorney DM, van Heerden JA, Ilstrup DM, Adson MA. Primary hepatic malignancy: surgical management and determinants of survival. *Surgery* 1989;106:740-9.
- 6 Tang ZY, Yu YQ, Zhou XD, Ma ZC, Yang R, Lu JZ, et al. Surgery of small hepatocellular carcinoma: analysis of 144 cases. *Cancer* 1989;64:536-41.
- 7 Zhou XD, Tang Y, Yu YQ, Ma ZC, Yang R, Lu JZ, et al. Solitary minute hepatocellular carcinoma: a study of 14 patients. *Cancer* 1991;67:2855-8.
- 8 Nagasue N, Yukawa H, Ogawa Y, Sasaki Y, Chang YC, Niimi K. Clinical experience with 118 hepatic resections for hepatocellular carcinoma. *Surgery* 1986;99:694-701.
- 9 Ebara M, Ohto M, Shinagawa T, Sugiura N, Kimura K, Matsutani S, et al. Natural history of minute hepatocellular carcinoma smaller than three centimeters complicating cirrhosis. *Gastroenterology* 1986;90:289-98.
- 10 Nagasue N, Yukawa H, Chang YC, Ogawa Y, Ota N, Kimura N, et al. Appraisal of hepatic resection in the treatment of minute hepatocellular carcinoma associated with liver cirrhosis. *Br J Surg* 1987;74:836-8.
- 11 Kemeny F, Vadrót J, Wu A, Smadja C, Meakins JL, Franco D. Morphological and histological features of resected hepatocellular carcinoma in cirrhotic patients in the west. *Hepatology* 1989;9:253-7.
- 12 Makuuchi M, Mori T, Gunven P, Yamazaki S, Hasegawa H. Safety of hemihepatic vascular occlusion during resection of the liver. *Surg Gynecol Obstet* 1987;164:155-8.
- 13 Registry of Hepatic Metastases. Resection of the liver for colorectal carcinoma metastases: a multi-institutional study of indications for resection. *Surgery* 1988;103:278-87.
- 14 Ezaki T, Yukawa H, Ogawa Y. Evaluation of hepatic resection for hepatocellular carcinoma in the elderly. *Br J Surg* 1987;74:471-3.
- 15 Lin TY, Lee CS, Chen KM, Chen CC. Role of surgery in the treatment of primary carcinoma of the liver: a 31 year experience. *Br J Surg* 1987;74:839-42.
- 16 Kanematsu T, Matsumata T, Takenaka K, Yoshia Y, Higashi H, Sugimachi K. Clinical management of recurrent hepatocellular carcinoma after primary resection. *Br J Surg* 1988;75:203-6.
- 17 Nagao T, Inoue S, Yoshimi F, Sodeyama M, Omori Y, Mizuta T, et al. Postoperative recurrence of hepatocellular carcinoma. *Ann Surg* 1990;211:28-33.
- 18 Yamada R, Sato M, Kawabata M, Nakatsuka H, Nakamura K, Takashima S. Hepatic artery embolization in 120 patients with unresectable hepatoma. *Radiology* 1983;148:397-401.
- 19 Kanematsu T, Furuta T, Takenaka K, Matsumata T, Yoshida Y, Nishizaki T, et al. A 5-year experience of lipiodolization: selective regional chemotherapy for 200 patients with hepatocellular carcinoma. *Hepatology* 1989;10:98-102.
- 20 Shiina S, Yasuda H, Muto H, Tagawa K, Unuma T, Ibukuro K, et al. Percutaneous ethanol injection in the treatment of liver neoplasms. *AJR* 1987;149:949-52.
- 21 Livraghi T, Salmi A, Bolondi L, Marin G, Arienti V, Monti F, et al. Small hepatocellular carcinoma: percutaneous alcohol injection. Results in 23 patients. *Radiology* 1988;168:313-7.
- 22 Takayasu K, Muramatsu Y, Moriyama N, Hasegawa H, Makuuchi M, Okazaki N, et al. Clinical and radiologic assessments of the results of hepatectomy for small hepatocellular carcinoma and therapeutic arterial embolization for postoperative recurrence. *Cancer* 1989;64:1848-52.
- 23 Tanikawa K. Non-surgical treatment of hepatocellular carcinoma. *Jpn J Gastroenterol Surg* 1990;23:2492-6. (Japanese with English abstract.)
- 24 Iwatasuki S, Gordon RD, Show BW Jr, Starzl TE. Role of liver transplantation in cancer therapy. *Ann Surg* 1985;202:401-7.
- 25 O'Grady JG, Polson RJ, Calne RY, Williams R. Liver transplantation for malignant disease: results in 93 consecutive patients. *Ann Surg* 1988;207:303-9.
- 26 Ringe B, Wittekind C, Bechstein WO, Bunzendahl H, Pichlmayr R. The role of liver transplantation in hepatobiliary malignancy. A retrospective analysis of 95 patients with particular regard to tumor stage and recurrence. *Ann Surg* 1989;209:88-98.

Ocular injuries from boxing

What about prophylactic laser coagulation of boxers' retinas?

All sports have their popular heroes, and the sound of leather on Gooch's willow or the crack of Faldo's drive are evocative of their powerful prowess. Indeed, the wheezy thud of a boxer's cushioned fist may betoken a force of over half a tonne, as in the instance of Frank Bruno's fiercest punch.¹ Anxieties over the dangers of boxing were never more publicly debated than when Britain's best loved sportsman was himself found to have sustained serious ocular trauma.

The eyes and adnexae of boxers suffer a panoply of blunt injuries, from orbital blow out fracture to "cauliflower choroid."² Apart from periorbital swelling and laceration, most damage arises from diffuse impact on the eyeball from the knuckle or thumb of the glove. Fair blow or foul, the effect of such frontal assault is a momentary deformation of the globe³ similar to that of a golf ball on impact. Because of the differential elasticity between the outer wall and contents of the eye, disruption of intraocular tissue ensues, especially at the iris root in the anterior chamber drainage angle, within the lens, or through the attachments of the vitreous to the retina. Few of the injuries give rise to symptoms or immediate visual loss, but in a sample of active professional boxers, 58% had at least one sight threatening injury to the angle, lens, or retina (half had bilateral damage).⁴

Ripping of the retina at its anterior annular limit (the ora serrata), often with avulsion of a strip of oral tissue, is pathognomonic of blunt trauma and has been reproduced by firing bullets at the cornea of excised pig eyes.⁵ The retinal breaks thus differ from those causing spontaneous retinal detachment in old age or myopia. The breaks may extend over 90 degrees of the retinal circumference—"giant tears"—as have occurred recently in three senior British heavyweights (one sustained bilateral giant tears). The subsequent traumatic retinal detachments are often slow to progress towards the macula and may present some months or even years after the injury. Nevertheless, with modern retinal and vitreoretinal surgical techniques, including (but not wholly dependent on) the use of lasers, the damage can generally be successfully repaired and the retina even deemed more secure than before the injury.

The anthropometric relation between the globe and its protective orbital shell is clearly important in predisposing

towards injury but is difficult to quantitate⁴ while the importance of myopia (whether by virtue of increased scleral elasticity, relative proptosis, or susceptibility to retinal tearing) is unproved. Racial factors may be relevant; black people are apt to have a shallow orbit but have a reduced tendency to retinal detachment.⁵ Another factor may be the orbital swelling that often develops during a hard fight.

Banning boxing, regarded by some as a mark of a civilised society⁶ but by others as "a modest tyranny,"⁷ would obviously provide the ultimate prophylaxis. (Ophthalmologists dealing with boxing injuries do well to distance themselves from the moral dilemma, not least because their management objective—cure and rehabilitation of their patient—may necessitate advising the boxing authorities on whether resumption of boxing should be permitted; the sport's limited credibility and sometimes millions of pounds in purse money ride on these decisions.) Revision of the official target area to exclude the head and the use of thumbless boxing gloves^{4,8} are resisted by punter and pugilist, but the British Boxing Board of Control has a visual standard, one purpose of which is to exclude boxers with appreciable myopia. A new strategy might be to undertake laser coagulation of boxers' peripheral retina, which, although unlikely to prevent retinal tearing, should limit retinal detachment. But the effectiveness of any preventive measures (whether thumbless gloves or retinal laser coagulation) could be judged only by a sorely needed longitudinal survey. Does the boxing board have the courage and clout to stage such a study?

DAVID MCLEOD

Professor of Ophthalmology,
Manchester Royal Eye Hospital,
Manchester M13 9WH

- 1 Atha J, Yeadon MR, Sandover J, Parsons KC. The damaging punch. *BMJ* 1985;291:1756-7.
- 2 Duggart JH. Fisticuffs and the visual organs. *Transactions of the Ophthalmological Society of the UK* 1951;71:53-9.
- 3 Weidenthal DT, Schepens CL. Peripheral fundus changes associated with ocular contusion. *Am J Ophthalmol* 1966;62:465-77.
- 4 Giovannozzo VJ, Yannuzzi LA, Sorenson JA, Delrowe DJ, Campbell EA. The ocular complications of boxing. *Ophthalmology* 1987;94:587-96.
- 5 Foos RY, Simons KB, Wheeler NC. Comparison of lesions predisposing of rhegmatogenous retinal detachment by race of subjects. *Am J Ophthalmol* 1983;96:644-9.
- 6 Lundberg GD. Boxing should be banned in civilised countries—round 3. *JAMA* 1986;255:2483-5.
- 7 Patterson RH. Commentary: On boxing and liberty. *JAMA* 1986;255:2481-2.
- 8 Smith DJ. Ocular injuries in boxing. *Int Ophthalmol Clin* 1988;28:242-5.