

fracture of cadmium-containing alloys, alkaline accumulators, cadmium-based pigments, or from any process where cadmium or cadmium-plated metal is heated to evolve fume. Cadmium is also used as a neutron absorber in nuclear reactors and is a constituent of some silver polishes.

Many of the workers exposed in the past to cadmium fume developed progressive dyspnoea, and some died after years of incapacity. Respiratory function tests have shown the presence of obstructive airways disease, and severe emphysema has been found in the lungs at necropsy.^{3,4} Most cadmium workers who become breathless have also developed proteinuria, while others have developed proteinuria without respiratory symptoms. While damage to the kidneys usually causes less incapacity than that to the lungs, some patients develop renal colic owing to the formation of stones, and a few patients have died from renal failure. The proteinuria in these patients is chronic, mild, and indistinguishable on electrophoretic examination from that occurring in patients with various renal tubular disorders.⁵ Concentration of the urinary colloids shows a relatively low albumin fraction with a predominance of α_2 and β globulins. Most of the proteins present are of relatively low molecular weight, and their appearance in the urine is believed to result from impaired reabsorption of proteins that are normally present in the glomerular filtrate.⁶ Other abnormalities described have been glycosuria, aminoaciduria of renal origin, hypercalciuria, and impairment of concentrating ability and of acid excretion, all of which point to dysfunction of the renal tubules.⁷

The manifestations of acute cadmium poisoning may be delayed some hours after exposure, whilst chronic poisoning usually develops insidiously at least two years after the start of exposure and occasionally some time after its cessation. The effects of this toxic element are irreversible at present, so that it is important to be aware of this uncommon condition and how to prevent exposure to cadmium fume and dust.

Autotransfusion

Recently in Nigeria A. Akinkugbe¹ has reported on the use of autotransfusion as a resuscitative measure in cases of ruptured ectopic pregnancy. Applicable to any case of severe intraperitoneal bleeding, autotransfusion is the simple expedient of collecting the patient's own shed blood from the peritoneal cavity, straining off any clot, and injecting it back into the veins. Especially in remote areas where blood donor or blood bank facilities are not available it can be a valuable adjunct to recovery.

Autotransfusion is not a new method of treatment, but, chiefly because donor's blood is usually available, it has lost favour. F. Stabler,² in 1934, reported the treatment of 13 patients with it, and F. P. Logan,³ in 1948, in South Africa, recorded 40 cases, with recovery in all. In recent years Chassar Moir^{4,5} has repeatedly advocated autotransfusion. He believes it is a valuable method of emergency resuscitation, especially in regions where blood banks are unknown. He states that he has used it "on many occasions" and "feels it a duty to demonstrate the method" to his students. He

quotes B. Markowski, who in British Honduras used autotransfusion in 100 cases, with survival in all but one.

A practical advantage of autotransfusion is the ease and speed with which it can be carried out, without the time-consuming grouping and cross-matching of blood. The blood which has collected in the abdominal cavity is simply ladled out with a galley pot or other suitable vessel and collected in a sterile flask containing 3.8% sodium citrate solution to make a proportion of nine parts of blood to one of solution. (If available, the "standard" bottle for blood donors containing 2 g. disodium citrate and 3 g. dextrose in 120 ml. water is convenient for the purpose.) When full the bottle is connected to the apparatus for intravenous infusion of saline set up before operation.

Only recently shed fluid blood is suitable for autotransfusion. But the method is intended for the collapsed patient with sudden intraperitoneal haemorrhage—the "acute" type of ruptured tubal pregnancy in which such blood is available in abundance. It is less suitable, and indeed it is not necessary, in the commoner "subacute" case (tubal mole), when the blood is old and firmly clotted.

Naturally, when donor blood is readily available, autotransfusion is apt to be forgotten, but this method of resuscitation, so simple and at the same time so effective, deserves to be better known and more widely used.

Construction of Vagina

The vagina may be congenitally absent or it may have been totally or partially excised for cancer of the uterine body, uterine cervix, or the vagina itself.

When the vagina is congenitally absent the uterus is usually absent also, and these patients have primary amenorrhoea. The ovaries are present and the girls are normally feminized. Occasionally—about 30 cases have been reported—a functional uterus is present which is capable of carrying a baby to term, and in fact has actually done so after a vaginal construction. Five to ten new cases of congenital absence are seen annually in the London hospitals which offer specialized surgery for this condition. Investigation of the patient should include intravenous pyelography to exclude associated abnormalities of the urinary tract, an examination under anaesthesia, and sometimes an exploratory laparotomy.

Congenital absence of the vagina is best treated by a McIndoe type of epithelial inlay operation.¹ A gynaecologist incises the perineum and dissects a retroperitoneal cavity. A plastic surgeon then introduces a rather thick partial-thickness skin graft from a thigh into this cavity round a prosthesis, and the labia minora are closed over it. When hard prostheses were used, fistulae, haematomata with loss of graft, urinary infections, renal stones, and extrusion of the vaginal mould were fairly common complications.² Soft prostheses are now available, the simplest of which is a cylindrically shaped piece of polyurethane plastic sponge, and with it postoperative complications are rare.³ As with all epithelial inlays, regular dilatation or constant maintenance of the original cavity size is necessary at first. The operation is therefore best performed three months before marriage, and once the graft has "taken"

¹ Akinkugbe, A., *J. Nigeria med. Ass.*, 1966, 3, 379.

² Stabler, F., *J. Obstet. Gynaec. Brit. Emp.*, 1934, 41, 768.

³ Logan, F. P., *S. Afr. med. J.*, 1948, 22, 793.

⁴ Moir, J. C., *Lancet*, 1960, 1, 60.

⁵ ———, *Operative Obstetrics*, 1964, 7th ed., p. 764. London.

¹ McIndoe, A. H., and Banister, J. B., *J. Obstet. Gynaec. Brit. Emp.*, 1938, 45, 490.

² Simmons, C. A., *Proc. roy. Soc. Med.*, 1959, 52, 953.

³ Jayes, P. H., *Ann. roy. Coll. Surg. Engl.*, 1966, 38, 210.

⁴ Pratt, J. H., and Smith, G. R., *Amer. J. Obstet. Gynec.*, 1966, 96, 31.

soundly a light, solid mould with a central lumen is worn until that time. Within three months of the operation the grafted skin in the new vagina is moist, corrugated, and remarkably like normal vaginal mucous membrane in appearance and feel. Intercourse can be fully satisfactory for both partners. These couples frequently adopt children.

When the vagina is absent owing to treatment for cancer, particularly when radiotherapy has been added to the surgery, there is much fibrous tissue. This may also be found in cases in which an inlay has failed. Pelvic dissection can then be difficult and the "take" of an epithelial inlay graft a little less certain. Nevertheless, the McIndoe type of operation, performed by an experienced gynaecological and plastic surgical team, offers an excellent chance of success and remains the operation of choice in Britain. In cases of cancer there is perhaps an occasional place for the old operations for vaginal reconstruction with an isolated segment of intestine, since they allow the vagina to be reconstructed at the original operation for treating the cancer. The large intestine is better than the small because it makes less mucus, but persisting vaginal mucous discharge is a major problem for these women. There is additional risk from the sigmoid anastomosis, where leakage and stenosis may occur. Stenosis has also occurred at the colo-vaginal anastomosis.

A recent report from the Mayo Clinic recommends one-stage surgical treatment of cancer and vaginal reconstruction with a segment of large intestine.⁴ This represents the reintroduction of the type of reconstructive operation which fell into disrepute between the two world wars because of the problem of sepsis. Infection is still a danger, but less so since the introduction of antibiotics.

False Positive Tests for Syphilis

A patient's serum found to give positive reactions with complement-fixation or flocculation tests for syphilis with lipoidal antigens presents a difficult problem, especially when there is no clinical evidence or history of infection. Such reactions may be due to latent syphilis which may require treatment, or they may be non-specific reactions.

Their differentiation with any degree of certainty was not possible until the development of specific tests using *Treponema pallidum* as antigen, such as the treponemal immobilization test.¹ There is still no serological test which will differentiate syphilis from other treponemal diseases such as yaws. In populations with a high incidence of treponemal disease, non-specific reactions with lipoidal antigens are rare in relation to the specific results. But when the incidence is

low an appreciable proportion of positive results with lipoidal antigens may be falsely positive, and J. L. Miller² has suggested that such reactions may be becoming more frequent.

These non-specific or biological false positive reactions are of two clinical types—an acute, transient reaction lasting a few weeks or months, and a chronic form which persists for more than six months, often for many years. The acute form usually results from an acute bacterial, viral, or protozoal infection producing fever, or from immunization procedures, such as vaccination against smallpox. It is thought to represent a reaction by some individuals whose antibody-producing mechanism is triggered off by stimuli to which the majority of people do not respond. F. W. Lynch and colleagues³ tested 212 university students after vaccination and found that 27% were reactive to one or more of a battery of six lipoidal antigens. Reactivity was maximal 19 to 22 days after vaccination and persisted for up to 122 days; it was seen more frequently in those showing a primary response. This transient type of non-specific reaction is not at present thought to be of clinical significance for the patient.

The chronic type of non-specific reaction has attracted more attention because it has been found to be associated in some cases with serious disease, often unsuspected. The only infection in which it occurs frequently is leprosy, especially of the lepromatous type, but there is an increasing body of evidence to show that these reactions may be found in association with collagen disease, particularly systemic lupus erythematosus.⁴⁻⁶

The general experience is that the chronic non-specific reaction is commoner among women than men and is most frequent in the third decade. Such patients may have overt disease, sometimes one in which autoimmune processes may play a part, such as systemic lupus erythematosus, thyroiditis,¹⁰ haemolytic anaemia, or polyarteritis nodosa. Other patients may be clinically normal, but laboratory tests show changes such as a raised erythrocyte sedimentation rate, increase in serum globulins, the presence of rheumatoid, L.E. cell, or antinuclear factors, anaemia, or abnormal liver function. Progression to clinically evident disease is more likely in this type of case. The non-specific reaction may often be the only abnormality found, but cases have been reported in which it was followed after several years by the development of frank lupus erythematosus.¹¹ Recent studies^{12, 13} have suggested that a high incidence of non-specific reactions may be found among elderly people, but that these are not necessarily associated with the systemic diseases frequently found with such reactions in younger patients.

The finding of a persistent non-specific reaction should call for further investigations to rule out the possibility of associated disease. Even though none is found it would seem wise to keep such patients under observation, especially if other laboratory tests show abnormal findings. A prospective study of the selective value of tests in forecasting the future development of disease in patients showing non-specific reactions might prove of great help in their management.

The next session of the General Medical Council will open on Tuesday, 23 May, at 2.15 p.m., when the president, the Rt. Hon. Lord Cohen of Birkenhead, will take the chair and will deliver an address.

¹ Nelson, R. A., and Mayer, M. M., *J. exp. Med.*, 1949, 89, 369.

² Miller, J. L., *N.Y. St. J. Med.*, 1958, 58, 2789.

³ Lynch, F. W., Kimball, A. C., and Kernan, P. D., *J. invest. Derm.*, 1960, 34, 219.

⁴ Moore, J. E., and Lutz, W. B., *J. chron. Dis.*, 1955, 1, 297.

⁵ Harvey, A. M., *J. Amer. med. Ass.*, 1962, 182, 513.

⁶ Miller, J. L., Brodey, M., and Hill, J. H., *ibid.*, 1957, 164, 1461.

⁷ ———, *Arch. Derm.*, 1959, 79, 206.

⁸ Catterall, R. D., *Quart. J. Med.*, 1961, 30, 41.

⁹ Berglund, S., and Carlsson, M., *Acta med. scand.*, 1966, 180, 407.

¹⁰ Shulman, L. E., and Harvey, A. M., *Amer. J. Med.*, 1964, 36, 174.

¹¹ Haserick, J. R., and Long, R., *Ann. intern. Med.*, 1952, 37, 559.

¹² Carr, R. D., Becker, S. W., and Carpenter, C. M., *Arch. Derm.*, 1966, 93, 393.

¹³ Tuffanelli, D. L., *Brit. J. vener. Dis.*, 1966, 42, 40.