Discussion

The most prominent feature of this series is the great increase of fatality rate with increasing age of the patient. This has been noted previously by many workers both in this country and in America, but little attention has been focused on the underlying reasons for it. It is conceivable that the older patients may die more readily either because the ageing organism becomes less adaptable or because local changes which predispose to massive haemorrhage may develop in the ulcer as a result of chronicity. Analysis of the present series shows that the length of history among patients with proved or probable chronic peptic ulcer has no bearing on the expectation of death, which seems to be related to general changes in the body consequent upon age. This conclusion is supported by other findings. Thus recurrent bleeding after admission to hospital occurs very little more frequently in the older than in the younger age groups. About the same proportion of young and old patients require massive blood transfusion; but, whereas the younger patients receiving massive transfusion mostly live, the older ones mostly die.

It would be convenient if we were able to compare this finding with the fatality of haemorrhage occurring from other causes, but there is no common cause of massive haemorrhage occurring over a wide age group. We have therefore been unable to seek confirmation along these lines. However, the general bodily changes induced by haemorrhage are somewhat similar to those occurring in "shock," and it is therefore of interest to examine the prognosis of perforated peptic ulcer in relation to age. Table XI, which has been compiled from the records of the Radcliffe Infirmary, shows that perforation of peptic ulcer produces a fatality rate which climbs steeply with advancing age.

It is unlikely that the local conditions in perforated ulcers can account for the great difference in prognosis between young and old patients. The marked increase in fatality rate with advancing years is therefore presumably due to changes in the whole organism. The similarity between these findings and those in haematemesis reinforces our previous conclusion that in haematemesis the poor prognosis in later life is mainly due to general bodily changes and not to local conditions.

TABLE XI.—*Fatality Rate of Perforated Ulcer by Age Groups*

Age Group	No. of Cases	No. Died	% Died
< 30	18	1	5·6
30–39 ..	34	1	2·9
40–49 ..	48	10	20·8
50–59 ..	41	12	29·2
60–69 ..	23	7	30·5
70+	9	3	33·3
Total ..	173	34	19·7

Haematemesis and perforation are the commonest major complications of chronic peptic ulcer, and both are dangerous to life if they occur in middle age or later. It is natural to speculate whether patients approaching middle age with a chronic peptic ulcer should be treated by partial gastrectomy largely as a prophylactic measure. In order to arrive at a decision we must be able to weigh the risk of elective partial gastrectomy against the chance of dying in the future from haematemesis or perforation of a chronic ulcer. On the one hand, the operative fatality rate of partial gastrectomy is known to be about 5% or less in patients under 50. On the other, there appears to be no precise knowledge of the chance of developing either of these complications. With this serious omission in our knowledge it is consequently impossible to reach any valid conclusion.

Summary

Among 305 cases of haematemesis admitted to the Radcliffe Infirmary as emergencies during the period 1938–47 there were 58 (19%) deaths.

Of these patients 208 had a history of proved or probable chronic peptic ulcer. The fatality rate among them was also 19%.

Both for the whole series and for the group with chronic peptic ulcer age was the most important factor influencing prognosis. The fatality rate rose steeply in middle age.

Among patients with chronic peptic ulcer the length of ulcer history had little bearing on immediate prognosis.

The frequency of recurrent bleeding was about the same in old and young patients, and about the same proportion received massive blood transfusions.

These findings suggest that general bodily changes, and not local conditions in the ulcer, are mainly responsible for the poor prognosis in later life.

We wish to thank Mr. J. Baxter and Miss Merry, of the Records Department, Radcliffe Infirmary, for their assistance, and Professor L. J. Witts and Dr. A. M. Cooke for their helpful criticism.

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PUNCH PROSTATECTOMY

BY

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Punch prostatectomy is a subtotal prostatectomy carried out through the urethra, thus avoiding an abdominal incision. Any paper that refers to the mortality rate for prostatectomy, by whatever method, must offer particular and precise information on at least the following points: the age and type of patient, the indications for prostatectomy, the number of permanent ambulatory suprapubic cystostomies, and whether those cases admitted with retention were subjected to early or late prostatectomy. These points largely determine mortality rates, and a low mortality rate in any series that omits particular reference to them carries no conviction; it merely reflects an accepted view that the present-day hazards of abdominal surgery in good or in moderately good risks are not high.

The mortality rate is known to be lower for private than for hospital patients. "This is due to the fact that the average hospital case is a notoriously bad risk, having neglected himself until complete retention or renal failure forces him to seek advice, whereas the private patient presents himself at an earlier and more favourable stage of the disease" (Kenneth Walker, 1933).

One may add a further and notable distinction—namely, that between municipal and voluntary hospital patients, a series of the former being heavily overweighted by physical wrecks with advanced degenerative changes and a physiological age well in advance of their calendar age. Until recent months this series has been composed entirely of municipal patients.

The safety of punch prostatectomy allows it to be performed in preference to suprapubic cystostomy, so that no permanent suprapubic cystostomies in ambulatory patients have been carried out in this series. The indications for

operation and the age of the patients are given in the accompanying Table. The routine treatment for cases admitted with retention of urine is decompression and drainage by urethral catheter, the patient being kept ambulatory during both procedures, followed by early punch prostatectomy. Complete bed-rest is unnecessary and detrimental. It should be emphasized that any statistical survey favours abdominal prostatectomy, as patients who present too great a risk for abdominal prostatectomy are accepted or transferred to the clinic for punch prostatectomy. In the Table no attempt has been made to separate the good from the bad risks—and many were the worst possible—or simple from malignant prostates. Many of the latter had widespread spinal metastases at the time of operation.

400 Cases of Prostatic Obstruction, Simple and Malignant, Treated by Punch Prostatectomy

Age Group	Cases	Age Group	Cases
30–39	2	60–69	158
40–49	10	70–79	140
50–59	66	80–89	24

Indications for Prostatectomy

(1) Retention:		(2) Dysuria, including haematuria	132
Acute	169	(3) Permanent suprapubic cystostomy	14
Chronic I*	81		
Chronic II*	3		
Mixed	1		
Total	254		

* Chronic I and chronic II cases are those with or without urinary symptoms respectively.

Mortality Rate

First 100	15%	Third 100	2%
Second 100	9%	Fourth 100	4%

One patient aged 36, with a previous retention at the age of 31, was found to be suffering from prostatic cysts, which were successfully resected. One hundred patients were resected with the diathermy loop before this instrument was discarded in favour of the punch instrument.

One case of *post-operative stricture* at the external meatus was rapidly cured by meatotomy and bougies. There was one case of *post-operative incontinence*.

Associated vesical lesions consisted of calculi, 4; calculi and diverticula, 2; diverticula, 2; carcinoma, 1. In two cases a diverticulectomy had to be carried out.

Raised blood-urea was encountered in 27 cases before operation, as follows: 200–250 mg. per 100 ml. in 2 patients, 150–200 mg. in 3 patients, 100–150 mg. in 8 patients, and 60–100 mg. in 14 patients. Most of these raised figures fell to normal with urethral drainage immediately before operation. There were two deaths, both in the last group. The results of preliminary urethral drainage in these cases of chronic retention do not suggest that this method should be discarded in favour of prostatectomy with the bladder undecompressed.

Raised Blood-pressure Estimations.—Systolic blood pressures of 200 mm. Hg or over were recorded in 43 cases. These readings were taken on the operating table immediately before operation without preceding ephedrine, and were in a few cases higher by 10–20 mm. than the resting pressures taken in bed. The highest pressure taken would not record on the 260 mm. Hg sphygmomanometer.

Mortality Rates.—The mortality rate of 15% for the first hundred is unduly high and is not likely to be repeated. It was due to a number of causes. The cases were then nursed in a chronic ward with all that this implies in a municipal hospital. The patients operated on represented in a high percentage the rejects and failures of abdominal prostatectomy—a resident or semi-resident population of aged men, some with high infected residual urines who were catheterized intermittently and others who returned to hospital at regular intervals to have phosphatic concretions removed from their suprapubic tubes. In addition there was a varied pathological group, also of shocking risks: one patient had been bedridden for ten years with syringomyelia before developing definite symptoms of prostatic obstruction. Lack of experience with the punch instrument contributed to the mortality rate in the first hundred and to a lesser degree in the second hundred. Of the two patients dying in the third hundred, one, aged 75, had been catheterized eight times before admission and the second was aged 82. After operation the latter patient, in a moment of mental weakness and using a razor that bore excellent testimony to the standards of the Sheffield Cutlers, performed a very radical amputation of his penis and scrotum.

The relevant details of the four deaths in the last hundred are as follows: at age 67, from advanced prostatic carcinoma; at age 65, a patient with paralysis agitans, death from pulmonary embolus—the only one in the series; at age 75, transferred with suprapubic cystostomy for punch prostatectomy, emaciation extreme; at age 75, a patient catheterized six times before admission.

External Urethrotomy.—In eight cases the calibre of the urethra was so small that the instrument had to be inserted through a small urethral incision.

Prostatic Carcinoma.—There were 55 cases (approximately 14%). Of these, 51 were treated by punch prostatectomy and the diagnosis was pathologically confirmed. In the remaining four the clinical or pathological signs or the response to oestrogen therapy left no doubt about the diagnosis. As the result of rectal and radiological examination, acid serum phosphatase estimation, and posterior urethroscopy, the pre-operative diagnosis was unmistakable in 48 out of the 51 cases. The proportion of occult prostatic carcinoma was therefore under 1%. One patient died of heart failure; the remaining two, on oestrogen therapy, are still alive without evidence of a recurrence six years and three years after resection. One further fact is worthy of comment. In dealing with a moderate-sized or large malignant prostate which is hard and nodular on rectal examination the amount of tissue removed at operation before the capsule is exposed is often surprisingly small. Rectal examination after such an adequate resection exposing the capsular fibres almost invariably reveals no change whatever in the hard nodular feel. This clearly shows that the greater part of the malignant tissue is outside the capsule. As it is very rare for the maximum size of a malignant growth to be elsewhere than at its point of origin—apart, of course, from metastases—this finding is evidence that this type of carcinoma has a very high incidence of origin from the posterior lobe.

Chronic Retention.—The cases of chronic retention have been classified into groups I and II, the former with urinary symptoms, the latter without. The clinical impression derived from these cases is that, with equal degrees of a substantial renal impairment as represented by the blood-urea estimation, the prognosis is worse in group II than in group I. This is an expected finding, as group II cases tend to be more chronic than group I, and the prognosis clearly depends on the length of time the blood urea has been raised as well as the height of the rise. Sudden emptying of the bladder in late group II cases may without doubt be fatal. I believe that these cases should be treated by a very slow decompression. The urinary output for 24 hours is measured—it may be normal—and this figure forms the basis for the decompression. The decompression is started by withdrawing from the bladder in 24 hours a volume of urine which exceeds this figure by 4 oz. (114 ml.); the bladder is therefore initially being decompressed at the rate of 4 oz. a day—a rate that may have to be increased later. This method is, of course, applicable only to group II cases.

Results of Follow-up

Punch prostatectomy, being a subtotal prostatectomy, is associated with a small recurrence rate, which in the hands of an expert employing the operation in nearly 100% of cases should be less than 3–4%. Abdominal prostatectomy, however, is not free from recurrence rate, six patients in this series having previously undergone abdominal prostatectomy. Too short a time has elapsed for an adequate statistical follow-up of the recurrence rate, but a clinical impression of the results of punch prostatectomy was obtained by sending for consecutive patients so that 100 attended for personal examination, the last patient having been operated on 12 months previously.

Of these 100 patients, 11 of whom were in their 80's, the urine was crystal-clear in 86, hazy in 11, and turbid in 3. Of the three patients with turbid urine one, aged 72, had undergone four previous bladder operations elsewhere for prostatic obstruction and bladder diverticulum, resulting in a suprapubic sinus and heavily infected urine. The sinus closed after punch prostatectomy. The second, aged 64, was admitted with a perforated duodenal ulcer and developed persistent urinary retention after operation. A severe urethritis complicated his catheter drainage and necessitated a suprapubic cystostomy. No aetiological factor was present in the third patient: he was symptom-free, with a nocturnal frequency of one. He stated that normally his urine was clear.

Nocturnal micturition was *nil* in 33 patients, once in 30 patients, twice in 25 patients, and more than twice in 12 patients. This latter group of 12 is composed as follows: 3 patients, two to three times; 4, three times; 2, three to four times; 2, four times; 1, six times.

One patient was aged 83 and 7 were in their 70's; 2 patients had malignant prostates; 3 had hypertension with systolic blood pressures of 250, 240, and 220 mm. Hg; 4 spent thirteen hours in bed, and many drank fluid during the night. One patient, a restless facile 79 whose nocturnal frequency was six, drank more than a quart of fluid during the night.

In this aged, or bad-risk, group the standard of judging post-operative results clearly differs from that obtaining in the fitter group. The former patients stay in bed longer, frequently drink fluid during the night, are more intolerant or restless, and show a high incidence of raised blood pressure, cerebral arteriosclerosis, myocarditis, and polyuria. For these patients to have survived operation with a good urinary stream must be judged a satisfactory result. Most of them would formerly have been considered unfit for prostatectomy and would have been treated by permanent suprapubic cystostomy.

Status of Punch Prostatectomy

Punch prostatectomy is no new surgical adventure. In the Mayo Clinic, where the operation is carried out in almost 100% of cases of prostatic obstruction, over 14,000 cases have been treated by punch prostatectomy since 1933. It can be safely said, therefore, that this operation has successfully withstood the tests of time and experience, so that the wave of enthusiasm that so often sweeps a new operation beyond its established limits has had time to recede.

The outstanding impression after 400 cases of punch prostatectomy is without question the greater safety of this operation as compared with abdominal prostatectomy. At least four patients successfully resected were so dyspnoeic that they could not lie flat either during or after the operation.

Case Record.—A patient, aged 80, was admitted in 1947 with prostatic dysuria and cystitis. The blood urea was normal; symptoms improved on penicillin and sulphamezathine, and therefore operation was not advised. He was readmitted 12 months later with incapacitating symptoms and a rising blood urea: no improvement occurred on penicillin and sulphamezathine. Punch prostatectomy was carried out under low spinal analgesia without a suprapubic cystostomy when his blood urea was 120 mg. per 100 ml. Convalescence was satisfactory; his blood urea returned to normal.

Operation on the worst risks indisputably provides the best test of safety. If an operation is safer for bad risks it is also safer for good risks. Five factors contribute to this safety: the operation is carried out under one of the safest of anaesthetics—a low spinal; the operation can be terminated at any point of time dictated by the patient's condition; it is a closed prostatectomy; an abdominal operation with all its well-known sequelae can be avoided; and there is a smooth, rapid, and ambulatory convalescence. The day after operation an average poor risk is on light diet and usually walks some 30 to 60 yards in one or two stages. Punch prostatectomy has reduced to a minimum operative trauma and therefore the operative mortality rate.

Apart from the route of access, punch prostatectomy possesses at least two distinguishing features. First, as the prostate is removed in portions the operation time varies directly with the size of the prostate; secondly, it is a highly specialized procedure requiring a long period of training. Failure to realize the importance of these two points may lead to some disillusionment. The operation time must not exceed three-quarters to one hour: a surgeon with little experience of this work may remove some 15 to 20 g. in this time. If the prostate is large (80–100 g.) the patient will at this rate of resection require multiple operations for an adequate removal, and if he is fit enough to survive these multiple operations will certainly develop a severe cystitis or pyelonephritis. Experience with the operation, however, increases both the speed and the safety of resection. The largest weight of tissue I have resected, in an orderly fashion with due care and time for adequate haemostasis, is 84 g. in one hour. This brings the majority of cases of prostatic obstruction, in one or two stages, well within the range of transurethral surgery. It has been estimated that in only 7% of cases does the prostatic weight exceed 100 g.

The textbook indications for punch prostatectomy are for prostatic obstruction due to fibrous, malignant, and small adenomatous glands and for prostate obstruction in bad surgical risks. The weak point in this classification lies in its confusion of clinical with pathological types, as it is quite clear that bad surgical risks, to whatever age group they belong, often have not only fibrous, malignant, and small adenomatous prostates but large prostates as well. A bad surgical risk, a large or difficult prostate, and an inexperienced resectionist constitute a lethal combination. The old idea that normal micturition can be restored for any length of time, or even restored at all, by "guttering" the prostate or by removing a few grammes of obstructing tissue is, I believe, quite wrong. Removal of the middle lobe in a trilobed enlargement may allow the lateral lobes to fall together and perpetuate the obstruction, and a further incomplete removal of one lateral lobe allows the opposite lobe to swing over and the obstruction may still be inadequately relieved. The removal of prostatic tissue in these bad surgical risks with large prostates must be substantial but need not be subtotal.

The indications for punch prostatectomy are, I believe, best given in terms of the size of the prostate and the experience of the surgeon; in other words, with great competence it is the operation of choice in the great majority of all cases of prostatic obstruction; with limited competence, some 15%. The occasional outsize prostate should be

treated by abdominal prostatectomy. The status of the operation is therefore not a fixed one. Furthermore, any relative contraindication to abdominal surgery—i.e., obesity or a bad chest—constitutes an important indication for transurethral surgery. In this series 99% of all cases were treated by punch prostatectomy.

Discussion

Although punch prostatectomy has reduced mortality rates to a minimum, outstanding problems still clearly exist. Those that derive from a chronically distended bladder occupy a foremost place, the most serious being a bilateral pyelonephritis due to penicillin-resisting organisms superimposed on kidneys already damaged by prolonged back pressure.

With the outstanding exception of Wardill's work at Newcastle-upon-Tyne, the opinions expressed in this country on punch prostatectomy on the whole have either been unfavourable or have unjustifiably restricted the scope of the operation. This may well be due to technical inexperience. John L. Emmett, of the Mayo Clinic, in a most helpful personal letter in reply to the question of the number of operations at which a surgeon should assist before being allowed to carry out a punch prostatectomy himself, states: "This question is very difficult to answer for the reason that the manual dexterity of individuals differs so greatly. I think, however, that a man should have had experience in at least a couple of hundred cases before he can consider himself fairly well trained."

So far, little mention has been made of what to the patient is the most attractive feature of the procedure—namely, the absence of an abdominal operation. Elderly patients show a well-founded aversion to an abdominal operation, many in this series having at first refused prostatectomy on the assumption that it meant a "cutting" operation. The popular appeal of this operation is based on sound clinical experience. It is perhaps not out of place to emphasize the fact that bad-risk patients with mild dysuria and a low residual urine require a period of observation before operation is considered. Indications for operations in this group must be clear and beyond dispute.

Conclusion

The outstanding impression is the safety of punch prostatectomy and its freedom from post-operative incapacity. It is applicable to the majority of cases of prostatic obstruction. For the aged bad risk group it is in a class by itself.

In highly specialized work the surgeon is very much in the hands of his theatre and ward staff. In both these respects I have so far been particularly fortunate.

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The Ministry of Health points out that patients in hospital for any length of time may accumulate substantial sums by way of benefit or pension from the Ministry of National Insurance or National Assistance Board. These sums, together with any cash handed over by the patient on admission, should be banked and a separate banking account maintained if necessary. A separate ledger account should be kept at the hospital for each patient who has money to his credit in this account and debited as cash or its equivalent is issued to the patient or purchases made on his behalf. Payments can also be made to relatives out of the account at the written request of the patient. In the case of mental patients for whom no officer has been appointed to act in accordance with paragraph 4 of H.M.C.(48)24, B.G.(48)22, a certificate should also be obtained from a medical officer that the patient understands the nature of the transaction. Any interest accrued to the patient's bank account may be placed to the credit of the committee's or board's endowment account for the benefit of patients' amenities generally. The accounts relating to these transactions should be under the control of the chief financial officer and should be submitted to the auditor.

OSTEITIS FIBROSA DISSEMINATA

BY

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Osteitis fibrosa disseminata is a regional fibrocystic disease of bone with distinct and characteristic features. Its aetiology is obscure. No familial or hereditary tendency has been noted (Lichtenstein, 1938), but its segmental distribution suggests that it may have its origin in a congenital abnormality (Adams *et al.*, 1940). The condition may be a sequela of icterus gravis neonatorum in which the liver fails to store and utilize vitamins (Braid, 1932, 1939). An embryological defect, with an associated endocrine condition (Albright, *et al.*, 1937), and an abnormality in the region of the hypothalamus or walls of the third ventricle (Shallard, 1940) are also postulated as causes. The common features of the disease, the bone changes, may be the response of bone marrow to various stimuli—inflammatory, neoplastic, metabolic, or simple mechanical (Freund and Meffert, 1936). Trauma is common in childhood, and perhaps is too often present in the patient's history to be only of accidental importance; yet the disease cannot be produced experimentally by trauma (Freund and Meffert). Local bone changes, starting in childhood from various centres in the same bone, may be due to osteoclastic absorption and hydropic degeneration of the fibrous bone marrow as a consequence of the augmentation of pressure due to impaired venous flow (Freund and Meffert).

Symptoms and Signs

The condition first makes itself evident in childhood or adolescence, usually by fracture or bony deformity, and no extraskeletal changes may be found. Braid observed from birth an infant who showed typical bone changes at the age of 2 years, and a second child who had the first of a series of fractures at the age of 1½. Both these patients suffered from icterus gravis neonatorum, and Braid states that at the age of 2½ years her female patient showed enlargement of the breasts and had a menstrual period, which lasted nine days. McClune reported bone changes in a 1-year-old infant, who also had icterus gravis neonatorum, in whom menstruation began at the age of 3½ years, and who was sexually mature at 4. Cutaneous pigmentation was seen in all three patients. There is no difference in the frequency of the sex incidence of the disease (Adams *et al.*, 1940); but endocrine dysfunction occurs typically in the female, and Albright described a further seven patients, four of whom were females, with the syndrome of osteitis fibrosa disseminata, areas of pigmentation, and sexual and somatic precocity.

Sex abnormalities in males are usually absent, although one case is recorded in which there was atrophy of the testes without any changes in the secondary sex characteristics. The general health is not affected and pain is conspicuously absent.

The Bone Changes

The bone lesions are the cardinal and sometimes the only features, and are responsible for the deformities and fractures which may be the first sign of the condition. Any of the skeletal bones may show the disease, but it is commonest in the lower limbs, where the ilium, femur, and tibia are most often affected. Bowing of the extremities is well marked, as in patients reported by Braid (1932, 1939) and by Murray *et al.* (1946); and kyphosis and