characteristics. His blood pressure was 134/102. The neck veins were engorged and pulsatile, the pulse was 90 a minute and regular. The apex beat was felt at the fifth left interspace, 3 in. (7.5 cm.) from the midline with a left ventricular impulse, and on auscultation both heart sounds were loud, with a rough systolic murmur, maximal at the left fourth interspace near the sternal margin. No thrill was palpable. The liver was enlarged two fingerbreadths below the costal margin and pulsatile.

Investigation showed polycythaemia of 7 millions with haemoglobin of 20.4 g. per 100 ml. E.C.G. showed left axis deviation. Screening and radiography confirmed the presence of a prominent left ventricle with poor pulmonary vascularization. A clinical diagnosis of tricuspid atresia was made, and angiocardiology subsequently showed direct passage of dye into the left auricle, causing it to opacify

early. The aorta was in the normal position, but the pulmonary artery was not seen. The case was regarded as one of tricuspid atresia with interatrial septal defect and no transposition of great vessels.

He was digitalized and kept resting in bed, with improvement, but cardiac failure occurred again in January, 1956, and this time the course was progressively downhill until he died suddenly on April 12, 1956.

Post-mortem examination showed an enlarged heart, mainly left ventricle. The tricuspid valve was completely atretic, and its position was indicated by a dimple on the right

Necropsy specimen showing probe in interventricular septal defect and a small vestigial right ventricle to the left of it, indicated by arrow.

auricle. A large interatrial septal defect 1.5 cm. in diameter, representing the persistence of septum secundum, connected the two auricles. The right ventricle was only a small cavity, measuring 1 by 0.5 cm., opening into the left ventricle through a small interventricular septal defect about 1 cm. in diameter (see Fig.). A normal pulmonary artery with valvular stenosis (valve opening 0.5 cm. in diameter) arose from the vestigial right ventricle. Ductus arteriosus was completely obliterated. The lung showed congestive changes with an infarct in the right lower lobe. Evidence of subacute bacterial endocarditis was found on the pulmonary valve cusps, which were grossly deformed but three in number. All other organs were normal except for a large thymus, which could possibly account for the observed deformity of the dye column across the mediastinum during angiocardiology.

Summary

A case of tricuspid atresia with pulmonary stenosis and without transposition of great vessels, surviving to the age of 20, is reported.

The special investigations and the post-mortem findings are correlated.

We are grateful to Dr. T. Balasingham for his necropsy report.

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COLD CONIZATION WITH SPENCER'S TRACHELOTOME FOR CERVICAL EROSION

A REVIEW OF 35 CASES

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Read (1955), referring to the problem of the unhealthy cervix, states: "It would appear obvious that in the case of all cervical lesions, before treatment is undertaken, the presence of malignant change must be excluded. Reliance on clinical appearance alone, except in minimal lesions, can be dangerous, and recent work has shown that even the clinically innocent-looking cervix can be the site of early malignant metaplasia."

Until the present day, cervical erosions have been treated in the out-patient departments of most centres in Great Britain by means of the electrocautery, while only in clinically suspicious cases have the patients been admitted to hospital for cervical biopsy as a prelude to cauterization. As a result cases are by no means unknown where an erosion has been cauterized on several occasions without healing taking place, followed by a belated biopsy examination showing the presence of a carcinoma of the cervix. Then, again, even in those cases which heal after cauterization it is certain that many instances of carcinoma-in-situ will be overlooked, with the result that invasive carcinoma may occur at a later date. It would therefore seem better that these patients should all have biopsies carried out as a preliminary to any form of treatment. More acceptable still would be a procedure, such as conization, where diagnosis and treatment are combined in one operation.

Historical

Conization of the cervix, as either a diagnostic or a curative measure, is not a new technique. As long ago as 1815 Lisfranc (1834), in the treatment of a case of suspected cervical carcinoma, is reported to have removed a wedge-shaped portion of the cervix which extended from the vaginal margin up as far as the internal os. Forty-five years later Hughier, of Paris, Marion Sims, and Thomas Emmett were all performing similar operations (Emmett, 1874). By 1916 Arnold Sturmdorf had devised an operation, the basis of which was conization followed by inversion of flaps of vaginal mucous membrane over the bare areas. In 1928 Mortimer Hyams introduced the electroconizer, the purpose of which was the removal of the endocervical mucosa. This instrument had an electrode only $\frac{1}{4}$ in. (3 mm.) wide, and was suitable for removing only a very limited portion of the cervix. The instrument was later improved upon by

Crossen (1935, 1949) in 1933, when he enlarged the head of the electrode to allow a much greater area of the cervix to be removed. As in the original Sturmdorf operation, flaps were used to cover over the bare areas.

Until this time the emphasis on conization had been mainly as a method of treatment, whereas with the introduction of the electroconizer it was recognized that affected tissue could be removed in a condition suitable for microscopical examination. Nevertheless, such specimens did suffer from the disadvantage of carbonizing the most important portion of tissue available to the pathologist and as a result did not gain much in popularity.

Biopsies continued to be made with punches, curettes, sharp spoons, and scalpels, usually at random, but sometimes guided by the application of Schiller's iodine. More complete specimens were again made possible when Ayre devised his angled circular biopsy knife, but, unfortunately, even with this it was not possible to include the whole of the endocervix in the specimen. Gusberg (1949), of New York, produced the endocervical coning biopsy curette, which is probably one of the first cold-conizing instruments. Although this could be used in the out-patient department of a hospital it suffered from similar disadvantages to Ayre's knife, and, in fact, Gusberg states that whenever necessary it should be supplemented by the use of a curettage and scalpel biopsy. About the same time increasing use was being made of the cold knife for conization in a further attempt to obtain better biopsy material. Harris and Peterson (1955) have reported on 367 patients on whom cold-knife conization was performed as a diagnostic procedure, and Scott and Reagan (1956), using an Ayre's knife for conization, emphasize how superior the method is when compared with other previous methods.

Spencer's trachelotome.

During 1955-6 two new instruments designed specifically for the purpose of cervical conization were reported on in the literature. The first was the trachelotome designed by Dr. Frank Spencer (1955), of Honolulu, and the second the conizing and biopsy knife of Professor J. Ullery (1956), of Ohio. The former was invented for the purpose of "obtaining an adequate biopsy in cases where suspicious or positive smears have been reported and no visible lesion is present," whereas the latter "evolved from the difficulties of present-day methods of obtaining biopsy specimens from the uterine cervix and of curing certain lesions."

It seemed to me that Spencer's trachelotome might be a useful instrument for the treatment of cervical erosions while yet fulfilling the needs of adequate biopsy material, and it is with this in view that the following series of cases have been examined.

Technique

Under general anaesthesia the patient is placed in the lithotomy position on the operating table, and after routine toilet and towelling dilatation of the cervix and curettage of the uterus are performed in all cases. It was found that a dilatation up to a No. 12 Fenton dilator was adequate in most instances, but in the case of the more extensive lesions dilatation had to be carried out up to a No. 14 dilator. A vulsellum forceps is then applied to each side of the cervix at the positions of 3 o'clock and 9 o'clock, just beyond the limits of the erosion. They are used to steady the cervix and apply counter-pressure. The head of the trachelotome is then introduced into the cervical canal up

to the level of the internal os and with short cutting movements in a clockwise direction the whole of the cervix is circumscribed. Where the erosion is large or the lips of the cervix are patulous it may be necessary to pivot the handle to varying degrees upon the head in order to include the whole of the affected area.

The instrument is then withdrawn and the specimen which has been collected in the head is later removed and sent for pathological examination along with any curettings obtained from the uterus. In order to control the bleeding from the cervix the cervical canal is then tightly packed with a rolled No. 4 absorbable gelatin sponge ("sterispon") and on removal of the vulsellum forceps the vagina is tightly packed with a long 3-in. (7.5-cm.) wide sterile gauze pack. The following day the vaginal pack is removed and the patient is allowed to become ambulatory. For 14 days after the operation a pessary containing penicillin, sulphanilamide, and sulphathiazole ("tampovagan P.S.S.") is inserted high into the vagina at night. Most patients are discharged home on the fourth or fifth post-operative day.

Difficulties of Operation

The operation itself is a simple one, but certain difficulties may be encountered. Occasionally with a large erosion, or in the presence of ectropion, it may be difficult to apply the vulsellum forceps to a portion of the cervix outside the diseased area. Spencer, in his original article, recommended that these should be applied at the position of 12 o'clock and 6 o'clock, but I maintain that if applied as described above one gets a better view of the area of operation and also a much more secure grip on the cervix. With the larger erosion care has also to be taken to include the squamo-columnar junction in the biopsy material, otherwise the erosion will not be completely removed, nor will a most important part of the cervix be available for pathological examination.

Irregular cutting movements with the blade may result in small tags of tissue being left around the external os, and these should be trimmed with a scalpel.

If conization has been over-enthusiastic too much cervical tissue may be removed, with the result that one has a large external os and cervical canal and thin anterior and posterior cervical lips.

Finally, bleeding may be heavy during the operation, but in only one case was it necessary to control it by means of electrocoagulation. In all other cases tightly packing the cervical canal with gelatin sponge and then packing the vagina with 3-in. (7.5-cm.) sterile gauze was sufficient. The latter served the dual function of maintaining the cervical pack in position and of acting as a haemostatic agent in its own right.

Results of Treatment

In all, 35 cases were treated by this method, and of these patients 57% were aged 35 or more (see Table). Results were assessed both from the physical cure of the erosion and from the effect of the treatment on symptoms.

Effect of Treatment on Physical Condition of the Erosion.—In 83% of cases the erosion was found to be completely cured four to six weeks after operation, while in the remaining 17% further treatment, usually with the electrocautery, was required before cure was complete. In the latter group of cases light cauterization, on one occasion, or on two occasions at the most, was all that was needed to produce a healthy cervix. Of the cases which required further treatment, 50% were classified originally as large erosions, 33% as moderate, and 17% as small. Where symptoms had existed for up to two years 87% of cases were cured in the first instance; from two to five years the cure rate was 75%, and over five years 75%. In patients under 40 years of age 82% of erosions were cured, while in those over 40 83% were cured.

Effect of Treatment on Symptoms.—With regard to the effect of the operation on symptoms, 80% of all cases were

Details of Cases

No.	Age	Duration of Sympt-oms	Associated Condi.tions	Size of Ero-sion	Bleed-ing at Opn.	Result	
						Ero-sion	Sympt-oms
1	50	7 mths	Metropathia haemor-rhagica	L	Mo	A	A1
2	47	2 yrs		M	Sl	A	A1
3	49	2½ "		S	Sl	A	A1
4	37	2 "		M	Mo	A	A1
5	47	5 mths		M	Mo	B	B1
6	23	5 yrs	Vaginismus and narrow introitus vaginae	M	He	A	A1
7	33	6 "	Cystocele, rectocele	L	He	B	B1
8	22	5 mths		M	He	A	A1
9	31	1½ yrs		S	Sl	B	A1
10	27	8 "		M	He	B	A1
11	53	3 "	" "	S	Sl	A	A1
12	43	6 mths	" "	M	Mo	A	A1
13	40	19 yrs		M	Mo	A	A1
14	41	6 mths	Anaemia, retroverted uterus	S	Sl	A	A1
15	32	10 yrs		M	Mo	A	A1
16	27	2 "	Cystocele	M	Sl	A	A1
17	25	1 yr		M	Sl	A	A1
18	23	6 mths		M	He	A	A1
19	36	9 "	Enlargement of right labium	M	He	A	A1
20	47	2 yrs	Subinvolution of uterus	M	Mo	A	A1
21	48	5 "		L	Sl	B	B1
22	50	7-8 "	Cystocele and rectocele	S	Sl	A	A1
23	45	14 "	" " "	S	Sl	A	B1
24	21	4 mths	" " "	S	He	A	A1
25	48	3-4 "	Fibroid uterus	M	Mo	A	A1
26	51	20 yrs	Retroverted uterus	M	Mo	A	B1
27	30	1½ "		M	Mo	A	A1
28	32	2 "	" "	S	Sl	A	A1
29	42	4 mths		L	He	B	B1
30	56	3 "	Cystocele, rectocele, vaginitis	S	Sl	A	A1
31	55	3 "	Kraurosis vulvae	S	Sl	A	A1
32	49	1 yr	Cystocele, rectocele	S	He	A	B1
33	26	12 yrs		S	Mo	A	A1
34	25	4 mths	Retroverted uterus	M	Mo	A	A1
35	31	7 "		M	Mo	A	A1

L=large (1 in.+ (2.5 cm.+)); M=moderate (½-1 in. (1.25-2.5 cm.)); S=small (½ in. (-1.25 cm.)); He=heavy; Mo=moderate; Sl=slight. A=erosion cured; B=erosion required further treatment. A1=symptoms cured; B1=symptoms improved.

considered to be cured, while in the remaining 20% there was improvement only. As would be expected, where there was an associated disease it was found that the rate of cure of symptoms fell to 76%, in contrast to 83% cure where there was no such associated condition. It was also found that the longer the symptoms had been present the less chance there was of complete cure. Up to two years the rate was 87%, between two and five years 75%, and more than five years 63%. In those patients who were less than 40 94% became symptom-free, compared with 67% in the group over 40.

Complications

As previously mentioned, bleeding at operation may be a troublesome complication, and it was found that the larger the erosion the greater this was likely to be. Where the erosion was classified as large 40% bled heavily; where it was of moderate size 26%, and when small only 18%. The period during the menstrual cycle at which the operation was performed did not appear to influence the amount of blood loss. On occasion bleeding was also found to occur several days after the operation. In two cases this was thought to be severe enough to warrant readmission to hospital and repacking of the vagina, while in a further three cases bleeding was brisk but was controlled with sedation and bed rest.

Sepsis was under consideration as a possible complication, but in actual fact was not encountered during the series. Its absence is probably due to the routine use of topical penicillin and sulphonamides for the two weeks following operation.

Most patients complained of some abdominal discomfort for a day or two after the operation, but in no case was this severe. In one instance there was temporary retention of urine which was thought to be due to an unduly tightly packed vagina. This was relieved once the pack had been removed.

As a later-occurring complication stenosis of the cervical canal was found in one case only. This was treated by gentle and repeated dilatations of the cervix in the out-

patient department. In one other case it was thought that too much cervical tissue had been removed, and the result was a large cervical canal with thin anterior and posterior lips. Whether this will later give rise to further trouble, should she become pregnant, remains to be seen.

Comment

The results of treatment by the above method would seem to compare favourably with those obtained when the electrocautery is used. The most important advantage of this technique over all others already mentioned is the fact that an excellent biopsy specimen is obtained for pathological examination. How important this can be is underlined by the fact that, in the small series treated, one case of carcinoma-*in-situ* was in fact diagnosed that would probably have been overlooked if some other method had been employed.

The disadvantages of the method are the need for admission to hospital and the greater incidence of bleeding, both at operation and later, when compared with other methods. The latter complication could, however, probably be overcome if, as Ullery recommends, conizations were followed by light cauterization in all cases. This was not done in this series, as it was thought that it might be more apt to produce stenosis of the cervix later.

What the effects of cold conization of the cervix on future pregnancies are likely to be can only at the moment be a matter of conjecture. It does not seem reasonable to suppose that these will differ greatly from the effects of conization with an electrode as reported on favourably by Champion and Thompson (1951).

Summary

A series of 35 cases of cervical erosion treated by means of cold conization with Spencer's trachelotome is described.

It is suggested that this is a superior method of treatment in that it provides an excellent specimen of tissue from all the possible sites of origin of carcinoma of the cervix.

I wish to thank Mr. Vivian Barnett and Mr. H. G. Wolskel, consultant gynaecologists to the Royal Salop Infirmary, for their advice and encouragement and for the provision of suitable cases. Thanks are also due to Dr. G. H. Grant and Dr. M. Symons, consultant pathologists, for their examinations of the specimens, and to Mr. Ross for his photograph of the trachelotome.

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Speaking at a meeting of the court of Leeds University on November 20, Sir CHARLES MORRIS, the vice-chancellor, discussed the student entry. The size of the medical school had remained unchanged, he said, because of deliberate policy by the university, in common with that of other universities; and the signs were that this policy would continue for the coming years. There were, as was well known, plenty of candidates for admission to the medical faculty, "though not perhaps plenty of as high quality as could be desired"; but no steps had been taken in recent years to increase the number of places available for them. It was accepted that in the light of national requirements there had been, and was now, no shortage of doctors, the vice-chancellor added. In so far as the university as a whole was concerned, it could be said with confidence that the quality of those admitted was fully maintaining itself, and that in some departments, mainly technological, it had improved greatly since the war and was still improving.