ment have taken a lively interest in sanitary improvement, and money was given without stint to carry out the various measures recommended for adoption; but, as the recognition of the importance of water as an agent in the distribution of zymotic contagia is of very recent date in this country, it need occasion no surprise that, under the difficulties attending the study of the causation of disease in India, Dr. Snow's great and pregnant discovery was little appreciated by Indian physicians. Facts, however, are rapidly accumulating, which show that water is perhaps the most important factor in the propagation of Indian epidemics.

ON THE REMOVAL OF PORTIONS OF THE DISEASED TISSUES IN CASES OF CARCINOMA UTERI.*

By ALEXANDER R. SIMPSON, M.D.,

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"THE grounds," says Mr. Moore, "on which an operation in cancer may be performed, should be distinctly understood. They are—first, the hope of entirely and finally eradicating the disease; second, that of obtaining some interval of health and useful life in its course; third, that of, on the whole, lengthening life; fourth, that of diminishing the total amount of suffering." (Holmes's *System of Surgery*, vol. i, p. 557.)

Gynæcologists are now-a-days nearly unanimous in recommending and having recourse to amputation of the cervix uteri in cases of malignant disease limited to the vaginal portion. Where the disease is of recent origin, and still restricted to a part which can be so easily removed, every one would see that the first of the grounds stated by Mr. Moore was present in its simplest form, and he would operate as speedily as possible, with "the hope of entirely and finally eradicating the disease." There are successful cases on record enough to warrant any man in repeating it. The instances are rare, however, where we find matters so favourably situated; for the disease has usually invaded the structures too deeply before the patient applies for relief to allow us to interfere with any hope so sanguine. Now, in this most common run of cases, I fear that, in spite of the encouraging results obtained and recorded by Dr. Braxton Hicks (*Guy's Hospital Reports*) and others, the opinion generally entertained regarding them by the profession is, that they must be allowed to run their gloomy course unmodified, and with only a half-hearted attempt to mitigate the symptoms. But it is well worth while considering whether we may not, by removal of portions of the affected organ, succeed in fulfilling one or other of the minor indications of procuring an interval of comparative health, or lengthening somewhat the patient's life, or diminishing her distress, in some of those cases where the great extent of the disease has cut from beneath our feet the first ground of interference.

DANGERS OF OPERATIVE INTERFERENCE.—It is not, certainly, an inviting field for operation. There is no room for brilliant display; and one cannot help being influenced by the hopelessness that overhangs the final issue of the malady. But, further, many are deterred from interfering in consequence of various apprehended risks.

1. *Hæmorrhage.*—The ordinary digital examination of a case of carcinoma uteri is apt to be attended with a certain amount of hæmorrhage, so that the practitioner dislikes touching it further than will be sufficient to make him sure of his diagnosis. But the bleeding is all from the vascular surface. If he had bruised the surface more deeply with his nail, instead of brushing it with the pulp of the finger, the discharge would probably not have been any greater. And, if such an encephaloid mass be broken into and dug out, and resolutely removed, the only hæmorrhage of any extent that takes place—and that is usually not great—occurs when the surface is being broken through, and it becomes less when healthier tissues are reached.

CASE I.—A. A., aged 40, single, from Berwick, had an excellent previous history, both personal and family. The present affection dated from May 1871, when the patient was suddenly attacked with a copious sanguineous discharge from the vagina—intermenstrual—unaccompanied by pain. These hæmorrhages returned at varying intervals of two and three weeks. For this condition she sought advice on October 28th, 1871 (six months after the first bleeding). She never had any pain. There was a copious offensive muco-purulent discharge. On examination *per vaginam*, a large, irregular, nodulated, soft, pulpy mass was felt, involving the os and cervix, and at some points, more especially posteriorly, extending to the body of the uterus. The tumour bled freely on the slightest touch. A small portion, which

was removed with the finger-nail without causing further loss during an examination, was found, under the microscope, to contain characteristic cancer-cells. On November 1st, with the uterine scraper applied to the more prominent parts, six or seven pieces, each about the size of an ordinary hazel-nut, were removed. The bleeding was very slight; and a saturated solution of perchloride of iron in glycerine, applied to the surface, arrested it completely. On November 22nd, the patient had continued well since the operation. She had had no pain nor hæmorrhage. The cancerous mass had not recurred to any appreciable extent. The outline of the os and cervix uteri was more defined and regular. The surface was less spongy and harder than on the first examination. The leucorrhœal discharge was diminished. She was discharged relieved.

2. *Pain.*—Some may shrink from interfering from the fear of causing pain to the patient; but, apart from the possibility of keeping the suffering in abeyance by the use of anæsthetics, it will be found that, though these patients suffer commonly enough to a degree peculiar to their disease, yet operations for the removal of the diseased mass are not attended with much suffering; so that they may be had recourse to, although the patient has not been anæsthetised.

3. *Aggravation of Disease.*—Nor need we fear that the progress of the disease will be hastened by this kind of interference; for the result of experiment shows that the more thoroughly the disease is removed, the longer it is of returning; and, when it does return, its progress is not more rapid than where it was left to itself.

CASE II.—Mrs. W., aged 25, married, the mother of four children, with three miscarriages, having good family and personal history, dated her present illness from a fall from a swing twenty months previous to July 1871. This fall was followed by a smart hæmorrhage from the vagina. Since then she had had constant pain, with frequent floodings, offensive discharge, and increasing weakness. In July 1871, on examination *per vaginam*, the os and canal of the cervix uteri were found sufficiently patent to admit an ordinary full-sized catheter. The cervix was transformed into a soft friable mass of about the size of a crown, readily bleeding when touched. The body of the uterus and vagina felt healthy. On August 2nd, the entire cervix was removed with the chain-*écraseur*, close to the roof of the vagina. Saturated solution of perchloride of iron in glycerine was applied. The patient did well.—July 1872. The patient had had, on three occasions since the operation, a slight intermenstrual discharge. She had enjoyed good health; had been free from pain and offensive discharge. *Per vaginam*, the stump of the cervix was felt, still thickened and enlarged, but hard and smooth, not bleeding on pressure. The disease had not advanced since the operation.

4. *Risk to Life.*—Again, the operation is not dangerous to life. I have amputated the vaginal portion of the cervix, or otherwise removed parts of the uterus affected with cancer, in twelve cases, and have assisted Sir James Simpson at a great many more, without witnessing any bad result. The only fatal case of which I saw anything was that related by Sir James in his clinical lectures (*On the Diseases of Women*, p. 174), where the patient sank and died suddenly a few hours after the operation, and where I assisted as a student at the *post mortem* examination, when no morbid change was discoverable in any organ that could be looked upon as the cause of death; and it was concluded that the patient died of collapse.

ADVANTAGES TO BE DERIVED.—But, even if the risk of operative interference be small, one may ask, What good results are to be expected from it?

1. *Arrest of Hæmorrhage.*—First of all, you remove the soft expanded vascular surface, which readily becomes the seat of extensive hæmorrhages. In many cases of carcinoma uteri, the profuse bleeding doubtless comes in part from the mucous membrane, which becomes hypertrophied as a result of the excitement in the whole organ attendant on the presence of morbid growth in it; but, whatever the source of the bleedings, menorrhagic or metrorrhagic, they are always lessened, and sometimes altogether arrested, by the removal of the accessible portions of cancerous tissue. This is more notably the case where we have to do with the so-called cauliflower-excrecence, or with the expanded epitheliomatous os uteri; and it is so even with encephaloid disease in the form of large irregular protuberances, and invading more deeply the substance of the cervix.

2. *Arrest of the Leucorrhœa.*—Hardly less detrimental to the health of the patient than these frequent hæmorrhages, is the incessant discharge of a fluid sometimes almost watery in its appearance and very profuse, sometimes less abundant, but of an acrid character, and in the greater proportion of instances possessed of a fœtor which of itself may suffice to declare to an experienced practitioner the nature of the malady. The persistent loss of so much fluid would of itself impair the health, and its deleterious influence is increased by its offensive character; and

* Read before the Midwifery Section at the Annual Meeting of the British Medical Association in Birmingham, August 1872.

this drain is, for a time at least, arrested when the morbid parts are removed, and a sore with a healthy non-malignant surface is left instead.

3. *Relief of Pain.*—In the case of cancer affecting the cervix uteri, pain is not necessarily a prominent symptom until the disease has made great progress, and is often so trifling as not to attract attention; nor is it greatly modified by efforts at the removal of portions of the diseased mass. But where the disease is seated in the interior of the uterus, pain is an early, most distressing, and almost constant symptom; and the relief afforded to the patient's suffering by ablation of even a portion only of the diseased tissue is immediate and striking. Let me cite two cases in illustration.

CASE III.—Mrs. M., aged 59, a widow and childless, after having ceased for some years to menstruate, began to be troubled with occasional slight discharges of blood and fits of pain in the pelvis. The hæmorrhage was not great in quantity, but, becoming pretty constant, the health began to give way. The attacks of acute pain, beginning in the back and passing round to the pubes, became frequent, and assumed a periodic character, coming on usually at bedtime, and preventing sleep. There was but slight and inoffensive leucorrhœa. The uterus was found retroflected, enlarged by half an inch, with the cervix healthy. The position of the uterus was rectified, and various sedatives employed, without any marked benefit resulting. Suspecting, from the peculiarity of the symptoms and the result of examination with the sound, that there was malignant disease in the interior of the uterus, I introduced a series of tents; and, when the cervical canal was dilated, could feel a series of indurated nodules just within the os internum. They were partially scraped away; and fragments, which were examined with the microscope, showed many double-nucleated cells in a fibrous stroma. The patient was greatly relieved for a time from her periodic pain, and the hæmorrhage abated. But I had found the uterus opened, and operated at a time when I had not satisfactory assistance; and, as I found her symptoms return, two months subsequently (November 1871), I again dilated the cervix, scraped away the cancerous nodules more completely, and applied powdered persulphate of iron to the raw surface. The patient had a threatening of pelvic peritonitis afterwards; but she rallied, and has since greatly recovered her strength, being relieved of the wearing-out pains, and free from the persistent hæmorrhage.

CASE IV.—J. F., farm-servant, aged 58, single, was admitted into the Royal Infirmary on December 14th, 1871. The patient, who was a stout plethoric woman, with a ruddy complexion, weighing about nineteen stones, had enjoyed good health until six months ago, when she was attacked by pains in the back and in the right and left iliac regions, accompanied by a red discharge. The pain, which she described as of an acute stinging character, recurred periodically between 12 noon and 4 P.M. every second or third day. Latterly it had recurred at the same time with increased severity. There was a thin watery leucorrhœal discharge, without any odour. She had always enjoyed good health till her present illness. The catamenia occurred at fifteen, and ceased five years ago. Her relations were long-lived and healthy. On examination, the vagina was found to be narrow and short. The hymen was persistent, and with difficulty admitted the forefinger. The os uteri was in its normal position, not shorter nor harder than usual. On combined internal and external examination, the uterus was felt enlarged; and this was confirmed by the introduction of a sound to the extent of half an inch further than normal. I ordered the patient to have a sponge-tent introduced. Owing to the narrowness of the os uteri, but a very small tent could be passed. This caused a great deal of fever and general irritation, and it was found impossible on that account to introduce a larger one for some days. On December 24th, a large-sized tent was inserted; and on the following day the os was found so dilated as to admit the passage of the forefinger into the cavity of the uterus. The mucous membrane of the uterus was found thickened, especially posteriorly and to the left at the fundus, where there were distinct fungating excrescences, varying in size from a pea to a French bean. These masses were scraped away by means of the intrauterine scraper. There was a smart hæmorrhage. A solution of equal parts of the saturated solution of perchloride of iron in glycerine, and water, was injected into the uterus, which stayed the bleeding. The masses removed were examined by the microscope, and found to contain characteristic cancerous cells. On December 26th, the patient complained of pain over the abdomen, Pulse full, 90. The pain over the abdomen was constant, but not acute. There was no bleeding. Half a grain of opium was given at bedtime. From December 26th to January 15th, the patient had on two occasions slight attacks of local pain, which lasted each time for about forty-eight hours; but these were attributable to indiscretions in getting up too soon, and to over-exertion. They were of an inflam-

matory character. The pain in the uterus had ceased to return periodically, and there was no sanguineous discharge. On January 20th the patient was sent home, feeling greatly relieved.

4. *Prolongation of Life.*—It would require a more extended series of cases than I am able to present to enable us to determine positively how far the longevity of patients is influenced by surgical interference. But I have seen no case where the operation seemed to have any damaging effect, and cannot doubt that the relief from suffering and the arrest of the exhausting hæmorrhages and leucorrhœal discharges must have a directly beneficial influence on the patient's life. Let me cite one case which presents some features of interest; and this, amongst others, that for seven years subsequently to the removal of a cancerous excrescence, the patient has remained free from any symptom of her disease.

CASE V.—Mrs. C., a widow, about 40 years of age, in humble circumstances, mother of one child, was left under my care in May 1865, by my friend Dr. Drummond, on his removal from Glasgow. She had suffered for many months from profuse watery discharges, not always offensive in character, interrupted by occasional hæmorrhages, and attended with frequent fits of pain. The uterine neck had been partially dilated by the unaided efforts of nature, so that Dr. Drummond could feel a foreign growth within the cavity; and, on dilating it further by means of tents, he succeeded in removing a soft friable mass, which he regarded as cancerous; and his opinion was confirmed by Professor Gairdner, who examined a portion of the tissue microscopically.*

The patient had rallied for a time, but when she came under my care her symptoms had all returned, and she was reduced to a state of extreme debility. She was so weak that at first I felt disinclined to interfere, lest she should sink under an operation. In July, however, finding that the growth was becoming more accessible, in consequence of a fresh dilatation of the os, and under a fresh and painful effort of the uterus to free itself of its contents, I dilated the canal with a large sponge-tent, and, partly with a wire *écasseur*, partly by means of a pair of polypus forceps, I broke down and removed, with the assistance of Dr. W. P. Mackay, now of Hull, all the diseased structure. The amount of hæmorrhage was not great, although the operation lasted a considerable time; and there was no bleeding subsequently, in consequence of a free application of perchloride of iron and glycerine, which I made to the whole interior of the organ. She was greatly exhausted, and remained long in delicate health; but her pains never recurred, and her health became so far restored that, when I last saw her some two years ago, she was able to support herself by her own labour. I should add that my own examination of the morbid growth entirely corroborated the opinion that had already been formed regarding it. It very closely resembled, in appearance and structure, the ordinary cauliflower excrescence of the cervix.

CASES SUITABLE FOR OPERATIVE INTERFERENCE.—Such being the risks and such the happier results of removal of portions of the uterus affected with cancer, you will see that the field for operative interference is very wide. Not only in cases where we have to do with a cauliflower excrescence, or with a mushroom-like epithelioma of the os uteri where the cervix is healthy, but also in encephaloid cases where there is a projecting fungating mass with a hyperæmic surface; and even in the scirrhus and other varieties, which present an excavated surface, and where the ulceration has not yet perforated the uterine and vaginal walls—in all these we put the patient in a better condition by removing all removable portions of affected tissue.

METHODS OF OPERATING.—When we have to do with an epithelial cancer of the lips which does not extend to the vaginal wall, and there is a healthy portion of the cervix like a neck to the tumour, or in any case where we have to amputate a projecting mass, by far the most satisfactory instrument is the galvano-cauter. Nothing can exceed the facility and precision of the application of the wire, and the certainty

* The symptoms of intrauterine cancer have been thus summed up by Sir James Simpson (*Selected Obstetrical and Gynecological Memoirs*, edited by Dr. Watt Black, p. 769): "1. The presence of an extensive and disagreeable discharge; 2. Frequent, profuse, and intractable menorrhagia; 3. The presence of a foreign body in the cavity of the uterus, detected by the uterine sound, and felt by the finger after the dilatation of the cervix, hard, rough, and irregular, or more soft, fungoid, and friable; 4. Pieces of the morbid texture peeled off or scraped off for microscopical examination; 5. The periodic recurrence of pains, slight and intermittent, perhaps, at first, but soon reaching a high pitch of intensity, at which it continues for an hour or two, and then gradually subsides." This tableau of the symptoms of malignant disease in the mucous membrane of the body of the uterus is the most perfect with which I am acquainted, and has been adopted by others, as by Dr. Fordyce Barker, in his admirable *Clinical Observations on the Malignant Diseases of the Uterus* (reproduced in Braithwaite's *Retrospect of Medicine*, vol. lxiii, p. 301, from the *American Journal of Obstetrics*, Nov. 1870, p. 519). But, according to my experience, it would be improved by placing the intense periodic pain in the first line, and noting that the discharge is not always profuse, and not often offensive. I believe that until the os uteri has been opened up, either under the natural efforts of the uterus at the expulsion of the new growth, or by the surgeon for the purposes of diagnosis and treatment, any discharge that does occur is inoffensive and nearly inodorous.

with which portions can be cut off, or more deep-seated parts subsequently cauterised. But it is troublesome to have the battery kept in order and carried about in ordinary practice; so that, whilst I have experienced the advantages of it, and have wished at every new case that I could have the apparatus at hand, I have had to content myself in most instances with the wire *écraseur* in cases of removal of softer tissues, and the original chain *écraseur* of Chassaignac for the amputations through the neck. I prefer the chain *écraseur* to the wire, because when a single strong wire was used and a rope of several strands, I have found it give way before the dense tissues of the cervix were cut through.

Where the disease is more sessile, having a broad base, and extending deeply into the substance of the cervix, it must be dug or scraped out by means of the finger-nail, or with a Recamier's *curette*. Simon of Heidelberg has advocated this plan of treatment in an admirable paper (*Beiträge zur Geburtshilfe und Gynäkologie*, i, 17), where he has related some very encouraging cases, and has figured the scoops which he uses of different sizes. I have had the instruments made after his model, of the largest and one of the smaller sizes, and found them very serviceable.

AFTER-TREATMENT.—As has been shown in the cases which I have cited, I have usually followed the removal of the morbid masses by the application of a powerful astringent—most frequently the saturated solution of perchloride of iron in glycerine, or the powdered persulphate of iron. These salts of iron serve not only as an effective styptic, preventing any immediate hæmorrhage from the injured surface, but they have a slight escharotic action, and help to destroy any of the affected tissue that may have been left. Latterly, I have made frequent use of a saturated solution of chlorate of potash, applied on pledgets of cotton-wool, to cancerous surfaces. I was induced to do so in consequence of the good results which have followed its use in this way in the hands of the younger Fabbri of Bologna, who has published the history of a case of cancrroid disease of the cervix, in which, under the subsequent application of chlorate of potash, the disease has been kept in abeyance for nearly three years. (*Uno Caso di Cancro Epitelliale del Collo uterino trattato coll' Amputazione della porzione intravaginale e quindi col clorato di Potassa*. Storia del Dott. Ercole-Federico Fabbri).

REMOVAL OF BOTH ASTRAGALI IN A CASE OF SEVERE DOUBLE TALIPES.*

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"FINIS coronat opus" is a motto which may be well applied where the operation we have to describe is novel in character, and therefore one in which it is needful to show cause why it should be performed at all. These remarks are applicable to the details I am about to relate of the removal of both astragali in a case of severe double talipes.

H. W., aged 7 years, a native of Whitchurch, Shropshire, was admitted into the Manchester Royal Infirmary, under my care, for double talipes equino-varus, on January 22nd, 1872. From the history, I learned that he had been born with the deformity; that, when six months old, he had been placed under the care of an orthopædic surgeon in London, the tendons had been divided, and he remained under treatment four months. He then had an apparatus for the feet, which he wore until he was thirteen months old; and after this he was provided with boots with irons attached, which he used until very shortly before the time when he first came under my observation. He could at one time move about pretty well; but, as he lived in the country, no farther attention was given to the case; no alteration was made in the size or strength of the apparatus, and it no longer controlled the vicious direction of the feet. The child walked upon the external border of each foot; the toes were turned inwards, almost to the transverse degree; the heels ceased to touch the ground; and, very rapidly, whatever improvement in the form of the feet might have resulted from the division of the tendons was entirely lost.

It was very apparent, on an inspection of the deformity, that the bones of each foot had become so crumpled up and faultily placed that the articular surfaces were changed in form, so as to interfere with their intrinsic movements, irrespectively of any limits to these from contraction of the tendons.

I made several attempts to diminish the distortion. The patient was placed under chloroform; and I endeavoured, by manipulation, to

break down any adhesions which might exist in the tarsal joints, and restore the position of the bones. But in this I could not succeed to the least degree. I next tried what could be done by long-continued pressure and traction, by using, first, a Scarpa's shoe with screw-action, and then Mr. Tufnell's tinned splint, with leg plaster straps; but in neither plan would the delicate skin of the edges and soles of the feet tolerate the necessary amount of pressure; and I was compelled reluctantly to stay all similar proceedings. It then occurred to me that, one great impediment to the replacement of the tarsal bones being due to a partial dislocation of the head of the astragalus from the cup of the scaphoid, by which an undue adduction of the portion of the foot in front of the medio-tarsal joint had been effected, if I could remove the astragalus, most, if not all, of these obstacles would vanish. And I did not hesitate to indulge in the possibility of such a result, seeing that I had known of cases in which, from injury and compound fracture near the ankle-joint, the astragalus had been completely dislocated and the bone removed—the patient, after a slow recovery, enjoying the use of a very serviceable foot. Such cases are well known to the profession; some of our most distinguished surgeons having specially referred to the urgent propriety of trying to save a foot under such circumstances, rather than condemning it to amputation.

Having duly considered the probable difficulties of the operation, and studied carefully what seemed to me the best mode of performing it, I proceeded to remove the astragalus from each foot by the following method.

On the 17th May last, the little patient being under chloroform, I commenced with the left foot, which was the more deformed. I made a longitudinal incision just over the most projecting part of the head of the astragalus, parallel to the antero-posterior axis of the foot, guiding it between the line of the outermost tendon of the extensor longus digitorum muscle and the tendon of the peroneus tertius. The incision being of sufficient depth, and about an inch and a half in length, I expected at once to come down to the cartilaginous surface of the head of the astragalus; but here I was met by an unexpected difficulty. The dorsal astragalo-scaploid ligaments which I had divided were so much thickened, so white and firm in structure, and so closely pressed upon the bone, that it was nearly impossible to be certain whether or not all the fibres were divided and the head of the bone fully exposed; this, however, being done, I tried with a gouge to raise the bone, while the scaphoid and the front part of the foot were bent backwards; and, in doing this, I cut off a thin piece of the edge of the cup of the scaphoid—there was so little space between the bones for the passage of the instrument, that it cut into the soft young bone. The same accident occurred when I used the gouge between the external malleolus and the side of the astragalus; for here, again, from want of space, I detached unwittingly a slice of the inner side of the malleolus, as the preparation will show. Fortunately, I had provided myself with a little instrument, which I here found very useful. It is a small, strong, curved hook, fixed in a stout handle (Fig. E); and it has on its concavity a cutting edge, while the edge of the hook is round and blunt.* This hook I used as a lever to raise up the astragalus, and lift it from the bed or socket formed for it by the scaphoid, upper surface of the calcaneo-scaploid ligament, and the os calcis; and, passing it round one end of the calcaneo-astragaloid ligament between the bones, by simple traction, I cut through the interosseous band in its whole length. This proved to be the key of the operation; for, after its division, I could dislodge the astragalus, and, holding it firmly with Sir William Ferguson's lion-forceps, made a few touches with the cutting hook, used first as a wedge between each side of the astragalus and corresponding malleolus to separate the bones, and then as a cutter to divide the bands of the lateral ligaments; the bone was thus set free and drawn out easily. There was little, if any, impediment from fibres at the back of the astragalus, and none at all, as I had anticipated, from adhesions of the tendon of the flexor longus pollicis to the sheathed groove in the bone; for, in fact, the groove itself was very shallow, and but poorly developed.

I need not say that, in operating on the right foot, I used only the cutting hook, and not the gouge or chisel, to detach the astragalus from its ligaments; so that, in this foot, I did not injure the neighbouring bones nor remove any portions of them.

The operation on each foot was conducted, from first to last, in strict accordance with those principles of antiseptic surgery which are well known as Mr. Lister's method. Catgut ligatures were used on two small arteries which were tied—the carbolised wax and resin sutures to close the wounds; these were enveloped in carbolised gauze, and the feet placed on rectangular splints. It could soon be seen what were

* Read in the Surgical Section at the Annual Meeting of the British Medical Association at Birmingham, August 1872.

* It is very similar to the guarded cutting hooked knife which I show in the museum collection as useful for the division of internal blind fistulæ.