I heard that on Sunday, June 9th, she was down stairs, and on the 19th I saw her. She was apparently quite well, had gained flesh; and appetite good. On examination, I found all trace of the tumour gone. The cicatrix of the incision, and a slight puckering of the skin, from which she said a little watery discharge occasionally oozed, was all that remained. The gangrenous gut had, in truth, sloughed away; the artificial anus had all but closed; and thus a thoroughly radical cure had been accomplished. A truss, with a folded napkin underneath was all she wore, and she was enabled to get about, relieved of the extra burden of her irreducible hernia.

ON THE REMOVAL OF TUMOURS BY ELECTROLYSIS.*

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THE object of this paper is briefly to state the results hitherto obtained by the method of starving tumours by electrolysis. Let me premise that the electrolytic treatment acts in a threefold manner, viz., first, through mechanical disintegration of the tissues by the nascent hydrogen; second, through chemical destruction by free alkalies—potash, soda, and lime, which are evolved at the negative pole of the battery; and lastly, through a modification of nutrition, by the dynamic effects of the continuous galvanic current on the vasomotor nerves of the parts brought under its influence.

The entire number of cases I have up to the present time treated by electrolysis, amounts to fifty-eight, amongst which there were forty-seven non-malignant, and eleven of the malignant kind.

Eleven cases of nævus have been under my care. Of these seven were cured; one patient was only seen once, and not heard of again; one discontinued the treatment before any appreciable result was obtained; two are still under treatment, and so much improved as to give the best hopes of eventual complete success. In none of these eleven cases was there, at any time during the progress of the treatment, any bad symptom whatsoever; and in most cases not a drop of blood was lost. In one case, the growth was so extensive that both Mr. Paget and Sir William Fergusson, who were consulted previously to the patient coming under my care, refused to interfere with the tumour. In another case, where the nævus was seated on the lower eyelid, Mr. Dixon had been previously consulted, and advised to leave the growth alone, on account of its position, although the nævus was a source of great annoyance for the patient. Neither an awkward position, nor extreme size of a nævus, can ever be an impediment to the electrolytic treatment, which I believe to be suitable for all cases of nævus, indiscriminately.

Of bronchocele, I have had eight cases under treatment. Of these, two were cured, one was improved, five are still under treatment and progressing favourably. In several of these cases, Mr. Prescott Hewett, Mr. Paget, and Sir William Fergusson, had been previously consulted, and had pronounced any of the ordinary operations to be inadmissible. Most of these cases were of an enormous size, and on that account required a long continuance of the treatment; but I believe my experience justifies me in saying that any case of bronchocele, however large, may, in course of time, be cured by electrolysis.

Of sebaceous tumours of the scalp and face, I have treated fourteen cases. Of these, thirteen were cured; the fourteenth patient was obliged to leave town before the end of the treatment, but would, from the change already caused in the tumour, have been cured by one or two more applications. In sebaceous tumours the treatment is short, as they never attain to any considerable size.

Of that hypertrophy of the skin which Mr. Wilson calls *eczyma mollusciforme*, I have treated five cases. Two of these were seated on the upper eyelid, two on the cheek, and one on the back of the neck. Four of these cases were cured; the fifth was not heard of again after two applications, but from the change already caused in the tumour, I believe that it must have disappeared long ere this.†

Of kelis, I have had one case under my care; but, as I saw the patient only once, I am unable to say whether any result has been obtained.

Of lipoma, three cases have come under my treatment. One of these is nearly cured; the other two patients discontinued the treatment before any appreciable result was obtained. One of these latter patients, a highly nervous gentleman, complained of pain and swelling of the tumour, after the application, and wrote to say that some matter was formed at one of the punctures. This is the only case where some

limited suppuration seems to have taken place in consequence of the galvanic applications.

I have cured a cyst of the lower lip, in a gentleman, aged 53, and a ganglion on the wrist of a lady, aged 30, by the same method.

Of glandular tumours, I have treated three cases, all of which were much improved, but none continued the treatment until the entire removal of the enlargement. Thus of forty-seven cases of non-malignant tumours, twenty-nine were cured, ten improved, and in seven cases no result was obtained, or the result unknown.

In malignant disease, of which I have treated eleven cases, the results of the process are, as might have been expected, far less favourable. Wherever the cancer is one of considerable size, and growing rapidly, the pain may be relieved, and the further growth of the tumour be considerably checked by the electrolytic treatment; but I have not hitherto obtained a cure of such patients. In two cases of scirrhus of the breast, where the constitution was apparently not suffering, and where the tumour was only of the size, in one of a filbert, and in the other of a nutmeg, the swelling has entirely disappeared; although, of course, I am not prepared to say that a cure has been effected. For the healing of an open cancer, the treatment seems to answer very well; I must say, however, that in no case of malignant disease have I ever trusted to electrolysis alone, but have prescribed at the same time powerful remedies to be taken internally, for modifying the constitution of the patient, such as bromide of potassium, belladonna, and quinine. Perhaps in course of time a more continuous application of the electrolytic process may be discovered, by means of which we may be able to starve out even malignant tumours with more success than has hitherto been obtained.

The only part of the electrolytic operation which is at all unpleasant to the patient, is the introduction of the needles through the skin. I, therefore, always use the ether spray, unless the patient himself objects to it. To some patients the smarting of the ether is more unpleasant than the prick of the needles, but in the majority of cases, the ether spray is preferred. The galvanism itself is almost, or even entirely painless, if judiciously applied. The length of the application should vary according to the nature of the case. For small tumours two or three minutes are frequently sufficient; for large ones fifteen to thirty minutes are preferable. In the latter, the best plan is to apply the current every day for some time; but I have also obtained satisfactory results where it was only done twice or three times a week. The instrument which I have found most useful for large tumours, is the *serres-fines* conductor, made for me by Messrs. Weiss. With this, from 2 to 6 needles may be introduced singly into the depth of the tumour; their heads are then grasped by the *serres-fines*, which are connected with the negative pole of the battery by means of ramified conducting-wires.

The safety of the treatment, which is its chief characteristic feature, seems to me in a great measure due to the fact of its belonging to the domain of subcutaneous surgery; for although there is a slight action on the skin, yet by far the greatest effect is produced in the substance of the tumour, owing to the superior electric conductivity of the soft and warm internal structures. Pyæmia and other much-feared consequences of surgical operations, therefore, do not follow the electrolytic applications. Add to this the painless nature of the proceeding, the absence of shock and of hæmorrhage, the fact that, during the whole progress of the treatment, the patient may follow his avocations just as usual; and I hope it will be acknowledged that this method bids fair to effect a substantial improvement in surgical therapeutics.

ON THE TREATMENT OF TUMOURS BY ELECTRICITY.

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THERE are three distinct methods in which electricity, in its various forms, may be employed by the surgeon: 1, as a cautery; 2, as an agent for chemical decomposition; 3, as a nerve-stimulant. It is, no doubt, a question whether the first and second forms differ merely in degree; but, as I do not propose to deal with them in the present paper, I shall not enter upon the question. The application of electricity for the chemical decomposition of tumours has found an able exponent in Dr. Julius Althaus. The ordinary uses of electricity in the third form are limited generally to cases of muscular paralysis or muscular atrophy. The induced and interrupted current gives the best results in the former; the continued galvanic current in the latter.

Early in the present century, when galvanism was still new, it was

* Read before the Surgical Section at the Annual Meeting of the British Medical Association in Dublin, August 1867.

† This case is now known to have been successful.

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