THE SURGICAL TREATMENT OF GRAVES' DISEASE.

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As the treatment of Graves' disease still remains in a somewhat unsettled state in this country, I thought it might be of interest to bring the notes of the following cases before this section of the Academy, and add some remarks upon the surgical treatment of this condition :--

M. K., a dressmaker, aged about twenty-four, was admitted into the Meath Hospital under my care on April 7, 1906. Her history was as follows :—On December 26, 1900, she noticed that her left eye seemed to be larger and more prominent than the right. Her colour, which had hitherto been good, altered very noticeably. Her face seemed to become generally swollen and the skin assumed a greenish hue. Six months after the left eye was noticed to be prominent her right eye also became prominent, but the prominence never seemed quite so pronounced as that of the left eye. At this time she developed an insatiable thirst, and used to drink enormous quantities of water. She likewise developed an inordinate desire to eat sweets. Her heart began to trouble her, and palpitations became very distressing. She could scarcely sleep at night on account of the rapid tumultuous beating of her heart, and her mother was unable to occupy the same bedroom with her on account of the violence of the heart's action. Then her neck became swollen; the enlargement appeared first on the right side, and gradually extended across the front of the neck. Nervousness made its appearance. She became easily frightened, dreaded going out of the house at night, and she began to give way easily to tears. In short, as she told me, she became "hysterical." She was compelled to give up cycling to business because of her nervousness, her palpitations, and the

breathlessness from which she suffered on the least exertion. Even when walking to business she was compelled to stand still for a few moments on account of the palpitations and breathlessness. Ultimately she was unable to go to business, and she became very depressed and got into very low spirits. Neuralgic pains now appeared in her head and face. Her stomach and feet became swollen—her feet so much so that she had to remove her boots on getting to business. Her hands likewise became swollen, so that she experienced difficulty in putting on her gloves. Loss of memory was noticed, and she developed a dislike towards and a feeling of distrust and suspicion of her friends. Her temper became very irritable. She had some dysphagia, and occasionally experienced a sensation of suffocation. Her face flushed frequently, and she often perspired profusely. She felt a throbbing sensation in the back of her neck, and complained of severe headaches. The latter were so severe that she thought she would go mad. Her hands became very tremulous, and she had a tendency to let articles drop. At the same time she frequently felt her legs suddenly give way, and felt that they were unable to support her. She complained of pain over her heart, and once over the left eye. When very ill she slept badly, and always awoke in great fright. She was restless and tossed about in bed. Her appetite was generally good; she vomited occasionally, and complained at intervals of abdominal cramps. The bowels were constipated. There was amenorrhœa. She frequently felt feverish and weak. Dr. Lennon saw her and took her into the Meath Hospital, where she remained for some two months, and for six months subsequently she followed his advice and took the medicines he prescribed. She improved for a time, and then relapsed. The patient attributed her condition to a fright she received on the Easter Monday prior to the onset of her symptoms, the fright being produced by a car upon which she was driving being almost upset. From that day she felt nervous.

The condition on admission to hospital was pretty much as described in the history she related, and which I have just detailed. She was kept quiet in a private ward for some three weeks, and during this time her pulse varied in frequency from 120 to 136 beats in the minute. Belladonna and digitalis were administered during this period. She was exceedingly tremulous,

and her agitation and nervousness were so pronounced that she could scarcely speak intelligibly. The urine contained neither albumin nor sugar. Operation was performed on May 7, a hypodermic injection consisting of morphine $\frac{1}{6}$ th gr. and atropine $\frac{1}{100}$ th gr. being given half an hour prior to the administration of the anæsthetic, which was chloroform. There was nothing unusual in the operation, which consisted in the removal of the right lobe, which was greatly enlarged, and with it almost the entire isthmus. The pulse for the subsequent twenty-four hours varied from 120 to 140, and the temperature rose to 101.4° . On the second day the temperature was normal, and the pulse fell to 120 again. Convalescence was uneventful, the drainage tube was removed on the third day, and the sutures on the sixth day. The pulse gradually fell in frequency until the tenth day, when she left for the convalescent home. On this day I found the record was 78 pulse beats, but, on counting it myself, it varied from 80 to 84 in the minute. The patient has since expressed herself to me as feeling better than she has felt for many years. The eyes are still prominent, but much less so than they were before operation. She had no palpitations, her muscular tremors are gone, and she is scarcely more nervous than any young girl would be whilst being medically examined.

Graves' disease, until comparatively recently, was generally looked upon as coming more within the province of the physician than the surgeon. I need scarcely trouble you with a list of the drugs usually prescribed. Phosphorus is probably the best of them. Naturally, we should have expected the somewhat fashionable animal extracts to have had their advocates. Not only have these been shown to be useless, but some of them, such as thyroid extract and ovarian preparations, have been shown to be positively dangerous. Cases treated from their initial stages by these preparations progressed rapidly from bad to worse. The beneficial effects ascribed to drugs would probably be more correctly attributed to the rest in bed and to the quiet to the nervous system generally.

More recently Lanz endeavoured to neutralise the poison in the patient's system by feeding his patients upon the milk of goats whose thyroid glands had been previously removed. He reported several cures. The outcome of this line of treatment was the production for the market of a powder of milk called rodogon. This powder supplies, or is supposed to supply, the principle conveyed by the milk of the thyroidectomised goats. The experience of other observers does not bear out the wonderful effects for these lines of treatment claimed by Lanz and his followers. In any case the treatment is not curative, but simply palliative. Professor Schlesinger, of Vienna, says his experience of the treatment of Graves' disease by the milk of thyroidectomised goats and by rodogon is negative, and not worth further consideration. The effect of treatment by injection of blood serum derived from sheep whose thyroid glands had been removed is thought to be more beneficial.

The operative treatment of this strange disease has undergone many transformations. Division of the isthmus of the thyroid gland, and even its excision, had their devotees some years ago. The operation of ligature of two or more of the thyroid arteries claimed its followers, but the most empirical of the operative procedures suggested and practised pretty extensively by some surgeons was that of sympathectomy on one or both sides of the neck. Considering the conflicting ideas that prevailed concerning the pathology and causation of the phenomena, it is not surprising that the effects of these various operative procedures were far from convincing physicians that operation provided better results than their electric drug treatment. In truth the one seemed just as empirical as the other. Even at the present time there will be no difficulty in finding surgeons who still consider Graves' disease essentially a physician's disease so far as treatment is concerned. Quite recently Mr. Berry expressed himself

strongly in the *British Medical Journal* in that direction. Considering the modern ideas respecting the pathology and causation of the phenomena of Graves' disease, Kocher, C. H. Mayo, and many others, whose experience is such as warrants them in drawing trustworthy deductions therefrom, state that thyroidectomy in some form or other is the proper line of treatment for this disease. Kocher says, by taking away the diseased gland in due time, one can cure even the severest cases of the disease, as one thus removes the source of the mischief by removing the organ in which the disease has its localisation. When, however, secondary changes have taken place in the fatty tissues of the orbits and in the cardiac muscle, &c., the complete re-establishment to normal conditions is hindered. The degree of amelioration of the symptoms, Kocher says, is in direct proportion to the amount of hypertrophied gland tissue removed or destroyed by the operation—that is to say, in direct proportion to the amount of diminution of the functions of the gland. The preliminary treatment consists in rest in bed with or without the administration of phosphorus or belladonna for some time before operation.

C. H. Mayo has adopted, as a preliminary to operation in severe cases, a course of exposure to X-rays, and in some such cases has had X-rays applied to the remaining lobe after operation, and apparently with beneficial results.

The mortality of any or all of these operative procedures was naturally at first high, but surgeons whose experience is great in this branch of surgery state that the operative mortality of Graves' disease will be but little in excess of that following partial thyroidectomy for simple colloid goître, provided the operation is undertaken before the patient's heart, muscle, and system generally have become degenerated by the toxic poisons circulating in the blood. The latest report of Kocher's operations to which I had access showed

that he had only one death in his last fifty-two thyroidectomies for Graves' disease, and that one was due to secondary hæmorrhage—a preventable condition. C. H. Mayo, in his last report, states that he had only two deaths in his last sixty-four thyroidectomies for Graves' disease. In considering the question of mortality, before deciding upon operation, one should consider whether the particular case is one primarily of Graves' disease, or whether the phenomena of Graves' disease have developed secondarily in a patient who had been the subject of an ordinary colloid goître for some considerable time before, as the mortality, so far as I am able to learn, seems much less after operation for secondarily developed Graves' disease, while the prognosis as regards complete and permanent cure after operation can be given with greater certainty.

The mortality after thyroidectomy for Graves' disease has been attributed to shock, to a combination of symptoms to which the name of acute thyroidism has been applied, to acute tetany and to the effects of general anæsthesia, as well as to pneumonia, sepsis and such accidental conditions. In five cases of death from acute thyroidism reported by one surgeon, albuminuria was present in all before operation. The condition of acute thyroidism has been attributed to the absorption of thyreotoxins which escaped into the wound after division of the isthmus of the gland, to the absorption of toxic blood serum from the wound, or serum containing thyroid secretion in suspension, or to rough handling of the gland during operation forcing a considerable quantity of thyreotoxins into the circulation.

To obviate as far as possible the risk of this complication one should handle the gland gently and expose it freely before actually handling it at all. Free drainage should be provided for twenty-four to forty-eight hours, and as little raw gland surface should be left exposed in the wound as possible. If

there is anything which increases absorption in a wound or gland it is loss of blood ; consequently one should endeavour to prevent this absorption by introducing a considerable quantity of saline solution immediately after the operation. Should some toxic absorption have already taken place the free administration of saline solution would dilute the poison and at the same time stimulate the kidneys to eliminate it rapidly.

To what extent the removal of, or destruction of, the parathyroids in the performance of thyroidectomy for Graves' disease plays a part in the subsequent mortality is at present uncertain. Their removal or destruction seems to be accountable for the acute tetany which occasionally causes death after thyroidectomy.

Halsted believes that the surgery of Graves' disease centres in the problem of removing the greater portion of the thyroid gland without sacrifice of the parathyroid glandules. This can be done by following the *technique* recently described by C. H. Mayo. It consists in peeling the posterior capsule off the lateral lobe during its removal, thus leaving that portion of capsule with the parathyroids on its posterior aspect intact.

As medical treatment is generally considered useless, and as surgical treatment is shown to be curative by men of experience such as Kocher and C. H. Mayo in early cases, and of pronounced benefit even in advanced cases, surely it is not asking too much of physicians who see these cases first to ask them to try the effects of surgical interference more frequently than they have hitherto done, and at an early period in the course of the disease.