

THYROIDECTOMY FOR EXOPHTHALMIC GOITRE.

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THIS mode of treatment is based upon the following facts:

I. That "the whole story of Basedow's disease lies in the thyroid gland." (Kümmell.)

II. That "chemically it makes no difference whether the secretion of the gland is increased or is chemically altered as the result of changes in the blood, in the alimentary canal, or in the central nervous system, the fact remains that the removal of the growing gland does away with the symptoms, and upon the failure to remove the diseased glands depends the failures to cure." (Schulz.)

III. That "the characteristic pathological change in the gland is a diffuse parenchymatous hypertrophy. Where goitre is endemic, this condition is engrafted upon it." (Hamig.)

IV. That "the secretion of the gland in the diffuse parenchymatous hypertrophy is increased in quantity, and is altered in quality." (Hamig, Edwards.)

V. That the complete removal of the gland rarely fails to show signs of degeneration in the central nervous system, the acute form of which is tetany, the chronic form, cachexia thyreopriva.

In several hundred cases, the ultimate results of the removal of the diseased portion of the gland have been more or less imperfectly observed. In about 125 cases, this observation has been very carefully made at periods varying from six months to twelve years. These cases have been reported by Rehn, Riedel, Mikulicz, Krönlein, Kappeler, Wolff, Kocher, Schulz, and Curtis and Booth.

The Mayos have recently reported 34 cases, but with no details.

In all cases reported in detail, where sufficient gland has been removed, the pulse-rate has fallen within 48 hours to 80 and 100 beats per minute. The unrest, the fear, the muscular tremor, and the melancholia have been relieved within the first week.

The exophthalmos has been the most difficult to relieve, and has often persisted two years before complete disappearance. I have seen some cases with a slight degree of it after five years.

A return of the symptoms, including the exophthalmos, after partial thyroidectomy has been reported by Mikulicz (3), and Schulz (2) in five cases. In one of these cases a parenchymatous nodule was only removed. In four cases a resection of one lobe was made. In all a second operation was performed, and a large part of the remaining lobe was removed. In Mikulicz's cases no record exists of the simultaneous recurrence of symptoms and the hypertrophy of the remaining lobe.

In one of Schulz's cases, a recurrence of all the symptoms accompanied an increase in size of the middle and opposite lateral lobe. In this case a second operation was performed, and the remaining lateral lobe was removed almost completely. The symptoms diminished immediately. The pulse fell to 90, and the exophthalmos and the nervousness disappeared rapidly. These cases seem to substantiate the fact that the removal of the diseased and growing gland, or at least the removal of a part, and the production of an atrophy of the portion remaining, is necessary to insure complete success.

Two conditions which take place during or just after operation have been of especial interest, namely, tetany and sudden death. Fortunately, these are not common. In one of Schulz's cases tetany occurred upon the fifth day, and was characterized by spasmodic contracture of the muscles of the calf and of the forearm, dysphagia, laryngospasm, and intense respiratory disturbance. The case was a fatal one from sudden syncope. This condition has not occurred in my cases. Sudden death has taken

place in one of my cases during anæsthesia, and at a time when least expected, since the operation was not a difficult one, nor had there been any untoward symptoms from the anæsthesia. Unfortunately, no autopsy was permitted. These sudden deaths have usually occurred under two conditions. In the one, thymic hypertrophy has been present with thyroid enlargement. In the other, no such thymic hypertrophy exists, although the death is equally sudden.

Marié finds that the thymus is always enlarged in congenital myxœdema, often in myxœdema occurring later in life, and sometimes in acromegalia. He has recorded five instances in which it was present in Basedow's disease. (Lanz.)

Mixed forms of myxœdema, acromegalia, cachexia thyreopriva, Basedow's disease, and the lymphatic-chlorotic constitution (*Status thymicus Paltauf*) are considered as pointing to a single definite lesion, with varieties more or less definitely known by these names. (Marié.) One of these varieties is the persistence of the thymus gland and the coexistence of the hypertrophied thyroid of Basedow's disease. The operation of thyroidectomy, indeed any operation upon the neck under these conditions, is dangerous because of the danger of syncope from diminished resistance, the result of the dyscrasia. This form of death has occurred six times in 319 cases, *i.e.*, 1.8 per cent.

So many cases of sudden death have occurred without the objective symptoms belonging to the lymphatic-chlorotic diathesis, and at the same time without the thymic hypertrophy, that we must believe that the resistance of the individual in Basedow's disease is greatly lowered from other causes than the dyscrasia. From a purely clinical stand-point, it seems probable that these sudden deaths are due to over-excitation and exhaustion of the nerve centres (heart and respiratory), induced, it may be, by an auto-intoxication from the hypertrophied thyroid gland. The death in my case was probably of this nature.

Medicinal treatment should precede surgical interference because of the undoubted cures which have taken place. This

treatment may be combined with the use of the X-ray (Mayo), or with the administration of milk or serum from thyroidectomied goats, sheep, etc. (Lanz and Moebius.) This method of treatment should not be continued too long, unless operative treatment is absolutely contraindicated, since the disease itself tends to diminish the vital resistance and to exhaust the nerve centres. It has been my experience that the earlier the diagnosis and the operation the easier the operation, and the less dangerous and difficult the after-treatment. I have found that in the severer types great benefit is derived from medicinal treatment, combined with rest in bed for two to three weeks previous to operation. The nervous excitation, the tachycardia, and the muscular tremor are so much improved that operation is often undertaken under much more favorable conditions. In the acutely progressing types of this disease, some have proposed an immediate operation because of their resemblance to acute intoxications. The advisability of such a procedure I am unable to substantiate, since it has never been my privilege to meet these types.

Early operation is, however, indicated in all cases as soon as medicinal treatment fails. The operation should not be reserved for the severer cases. The earlier the operation the better the condition of the patient to withstand the ordeal, and the less distressing the after-treatment.

The early operation is especially indicated where Basedow's disease is engrafted upon a colloid goitre.

All of my cases have been operated upon with ether or gas and ether. This has been preceded in some cases by atropia sulphate, $\frac{1}{100}$ grain, and in others by morphia, $\frac{1}{4}$ grain. The cases which demand local anæsthesia and in which general anæsthesia is contraindicated, I have not seen as yet. An experienced anæsthetist is absolutely necessary, and a very small amount of the anæsthetic is to be used.

The extirpation of the greater part of the growing gland is made in all cases. Usually, one lobe and the isthmus are quite sufficient, but when the hypertrophy is vascular and bilateral, I think the symptoms have been best relieved when

one lobe, the isthmus, and a part of the opposite lobe are removed. In some instances the superior or the inferior thyroid artery of the opposite lobe has been tied in addition to the unilateral thyroidectomy. This was done to produce atrophy in the remaining lobe.

The method employed has been practically that of Kocher.

CASE I.—Female, 20, 1897, xii, 10; 1898, i, 10. *Previous History*, negative. *Present History*.—Immediately after childbirth, two years ago, neck began to swell; three months ago, palpitation.

Examination.—Anæmic. Exophthalmos. Graefe's symptom. Pulse, 134. Moebius and Stellwag's symptoms abnormally strong. Pulsation felt in vessels of neck. Both lateral lobes are enlarged. Right lateral and middle lobes give the bulk of the mass.

Operation, 1897, xii, 15. Gas, ether, morphia. Right lateral lobe and isthmus and middle lobe removed.

Immediate Result.—Temperature below 100. Nervousness and heart action better. Pulse, 90. Healing without reaction. No acute thyroidism.

Present Result.—Seven years after operation. Best of health. Exophthalmos and tachycardia have disappeared. Pulse, 75 to 80.

Pathological Examination.—Colloid struma.

CASE II.—Female, 18, 1897, v, 10; vii, 3. *Previous History*, negative. *Present History*.—One year ago at menstruation nervousness and tremor followed within two months by enlargement of the right side of the neck. Exophthalmos and palpitation.

Examination.—Cachectic. Right lateral hypertrophy of thyroid; pulsates strongly on pressure. Palpitation, 130 to 140. Graefe and Moebius symptoms. Exophthalmos.

Operation, 1897, v, 12. Gas and ether. Extirpation of the right lateral lobe and isthmus. Ligature of left superior thyroid.

Immediate Result.—Reactionless course. Four days after operation, pulse, 90; less nervous, less tremor, no palpitation.

Present Result.—Seven years and five months after operation, continued improvement. Exophthalmos gone.

Pathological Examination.—Right lateral lobe and isthmus show colloid struma.

CASE III.—Female, 17, 1898, v, 30; vii, 1. *Previous History*, negative. *Present History.*—Eight months ago neck began to enlarge. Prominence of the eyes; palpitation and nervousness have increased steadily in spite of medicinal treatment.

Examination.—Anæmic. Headaches, unrest. Tremor of the hand. Pulse varies between 110 and 160. Graefe's and Moebius's symptoms are present. Exophthalmos well marked. Left and right lateral lobes are enlarged, the right especially. The swelling is soft and pulsates strongly.

Operation, vi, 5. Gas and ether, morphia. Removal of the right lobe and part of the left lobe.

Immediate Result.—Reactionless healing. Two days after operation, temperature was 100°, 101° F.; pulse, 100 to 120. Palpitation and nervousness are less. Sleeps well.

Present Result.—Six years and seven months after operation. Pulse, 70 to 80. Exophthalmos scarcely observable. Does her work without difficulty.

Pathological Examination.—Parenchymatous goitre.

CASE IV.—Female, 26, 1899, iii, 12; iv, 20. *Previous History*, negative. *Present History.*—About five years ago noticed an enlargement of the neck, with exophthalmos, palpitation, and nervousness. Four years ago, while in the country for three months, all nervousness disappeared, and she suffered alone from palpitation, with pulse frequency of 90 to 110. This continued for one year, when all symptoms returned. Medicinal treatment has failed to give relief.

Examination.—Exophthalmos. Graefe's and Stellwag's symptoms. Slight difficulty in swallowing. Pulse, 120 to 110. Heart sounds are good. Slight tremor of the hands. Excessive nervousness. The left lateral lobe is greatly enlarged. The right is not palpable.

Operation, iii, 14, 1899. Gas and ether. Removal of the left lobe. The right not touched.

Immediate Result.—Reactionless course. Pulse fell to 90 on second day. Less nervous and anxious.

Present Result.—Five years and nine months from the operation. Exophthalmos gone. Nervousness and tremor have disappeared. In good health and strength.

Pathological Examination.—Parenchymatous goitre.

CASE V.—Female, 39, 1901, ii, 15; iii, 5. *Previous History*, negative. *Present History.*—Seventeen years ago a small swelling appeared upon the left side of the neck. It remained so until eight years ago. It has steadily grown during the last three years. Nervousness, palpitation at times. Difficulty in swallowing.

Examination.—On the left side the thyroid is enlarged. Slight exophthalmos. Some muscular tremor in hands. Palpitation upon slight exertion; heart jumping from 80 or 90 to 160 per minute.

Operation.—Removal of the left lobe, isthmus, and middle lobe.

Immediate Result.—Temperature fell from 101° F. on day after to 99° F. on the third day after operation. Pulse remains at 90; nervousness and tremor disappearing.

Present Result.—Three years and ten months after operation. No exophthalmos, no restlessness, no palpitation on exertion. Best of health.

Pathological Examination.—Left lateral lobe presents a firm tissue with several cysts. Alveoli are slightly distended with colloid material. The stroma is infiltrated with a thin albuminous substance, probably colloidal. There is an increase of fibrous tissue in the stroma.

CASE VI.—Male, 31, 1901, iv, 25; v, 23. *Previous History*, negative. *Present History.*—One year ago neck enlarged. Eyes began to be prominent eleven months ago. Became nervous, with palpitation of heart on slight exertion. Difficulty in swallowing.

Examination.—Marked exophthalmos. Tachycardia. Pulse, 120; respiration, 28; temperature, 99° F. Tremor of hands. Great nervousness. Compression of the trachea and œsophagus by the growth. Bilateral thyroïdal enlargement, with substernal prolongation.

Operation, iv, 28. Gas and ether. Removal of both lobes was necessitated because of the substernal character of the growth and the collapse of the patient during the operation.

Immediate Result.—Great restlessness. Excessive irritability. Temperature rose to 106° and 104.6° F. following in the twenty-four hours to 99° and 100° F. Pulse, 172, 160, 140,

108. Respirations, 42, 28, 32. This condition continued for three days, when it gradually abated. "Acute thyroidism."

Present Result.—Three years and eight months from operation. Tachycardia and restlessness gone. Pulse has not been felt above 90, even during his work as a peddler. Exophthalmos still noticeable. Lids close easily and there is no stare.

Pathological Examination.—Enlargement of the lobes is uniform. Medium-sized alveoli distended with colloid material; stroma is normal. Right lobe 9 centimetres, 4 centimetres, 3 centimetres. Left lobe $8\frac{1}{4}$ centimetres, 4 centimetres, 3 centimetres. Isthmus $4\frac{1}{2}$ centimetres, 5 centimetres, $2\frac{1}{2}$ centimetres.

CASE VII.—Female, 34, 1901, iv, 19; v, 3. *Previous History*, negative. *Present History.*—Began five years ago upon the right side of neck. One year ago the eyes began to bulge. Five months ago, tachycardia; pulse-rate greatly increased; has become very nervous. Temperature, 100° F.; pulse, 124.

Examination.—Marked exophthalmos; tachycardia; nervousness. Right thyroid lobe is enlarged; heart, lungs, and kidneys are normal.

Operation, iv, 20. Gas and ether; morphia. Removal of the right lateral lobe.

Immediate Result.—Temperature ran between 99° and 103° F. for three days. Pulse from 155 to 80. During this time she was very restless and frightened. These symptoms gradually abated. The restlessness disappeared entirely as the temperature and pulse returned to the normal.

Present Result.—Three years and eight months after operation. Nervousness and tachycardia gone. Exophthalmos scarcely noticeable. Pulse-rate normal. Works daily without fatigue.

Pathological Examination.—Right lobe and isthmus are greatly enlarged, due to hypertrophy of the gland tissue, with increase in the colloid material. "Adenomatous goitre."

CASE VIII.—Male, 39, 1901, iv, 23; v, 11.—*Previous History*, negative. *Present History.*—One year ago right side of neck enlarged; at present it is markedly enlarged. Four months ago the eyes became prominent. Nervousness has recently occurred. Palpitation on slight exertion.

Examination.—Moderate exophthalmos. Tachycardia.

Pulse, 130; temperature, 99° F.; respiration, 30. Excessive nervousness. An enlarged right lobe of the thyroid.

Operation, iv, 25. Gas and ether. Removal of the right lobe and of the isthmus.

Immediate Result.—Temperature, 103° F.; pulse, 132; respiration, 28. Nervousness. Restlessness and tremor of hands. These symptoms continued for three days, when the temperature and pulse returned to the normal. The tachycardia and restlessness now disappeared.

Present Result.—Three years and eight months from the operation. Tachycardia. Nervousness and exophthalmos have entirely disappeared. Works daily as a tailor.

Pathological Examination.—Adenomatous enlargement of the isthmus and right lobe of the thyroid gland.

CASE IX.—Female, 23, 1902, iii, 11; iii, 13. *Previous History*, negative. *Present History*.—Began four years ago. Nervous, palpitation and general tremor began two years ago. Dysphagia. Temperature, 100° F.; pulse, 134, irregular; respiration, 28. Otherwise normal.

Examination.—Marked exophthalmos. General tremor. Tachycardia, 116 to 124. Nervous. Lungs and kidneys normal. Bilateral thyroid enlargement, soft and vascular variety.

Operation.—Gas and ether. During extirpation of the left lobe, the patient suddenly became cyanotic. Respiration and pulse stopped at the same time. No efforts at resuscitation availed. Two and one-half ounces of ether had been administered. This condition happened suddenly and unexpectedly. There was no thymic hypertrophy found at this time.

Immediate Result, death.

Pathological Examination.—No autopsy was permitted. Simple vascular adenomatous enlargement of the left thyroid lobe.

CASE X.—Female, 30, 1902, iii, 25; iv, 23. *Previous History*, negative. *Present History*.—Five years ago nervous exhaustion with some exophthalmos and palpitation as symptoms. Four years ago exophthalmos began to diminish. Four years ago swelling in the neck was first noticed. An improvement took place three years ago, and continued until one year ago, when all the symptoms returned with greater intensity.

Examination.—A diffuse bilateral thyroid enlargement.

Marked exophthalmos. Tachycardia. Pulse, 120 to 130. Nervous. Tremor of hands. Graefe's and Stellwag's symptoms. Lungs and kidneys normal.

Operation, iv, 2. Gas, ether, and morphia. Removal of both lobes, leaving an enlarged middle and a small part of one lateral lobe so as to preserve the superior thyroid artery and vein for its nutrition.

Immediate Result.—Restlessness and tremor began to diminish on the second day. On the same day, pulse, 90; temperature, 100° F. On fourth day, pulse, 80; temperature, 99° F.

Present Result.—Two years and nine months after operation. Exophthalmos almost gone. Tachycardia and nervousness disappeared. Walks long distances without heart palpitation. Tremor gone. Health perfect.

Pathological Examination.—Bilateral adenomatous thyroid enlargement; very vascular.

CASE XI.—Female, 27, 1902, viii, 7; ix, 7. *Previous History*, negative. *Present History*.—Five years ago. Palpitation, nervousness and tremor began. Four years ago, exophthalmos. Neck began to swell four years ago. These symptoms have increased steadily, with frequent intermissions.

Examination.—Bilateral enlargement of the thyroid gland; soft to pressure. Pupils dilated. Marked exophthalmos. Nervousness. Heart overacting and sounds heard all over the chest. Pulse, 104 to 120. Temperature, 99° F. Lungs and kidneys normal. Graefe's and Moebius's symptoms present.

Operation, x, 6. Gas and ether, preceded by atrophina sulphate, $\frac{1}{16}$; changed to chloroform. One and three-fourths lobes removed. The upper quarter of one lobe was preserved with its circulation intact.

Immediate Result.—For seven days, temperature remained between 99 and 102° F.; pulse between 120 and 80; respirations between 20 and 24. The nervousness and the tachycardia gradually diminished. The tremor less rapidly. The exophthalmos not at all.

Present Result.—Two years and two months after operation is in the best of health. Slight exophthalmos, but all else has disappeared. It is noticeable in the history that seven months after operation this patient seemed to present some signs of cachexia thyreopriva in that she became listless, even stupid at

times, with short and brittle hair and a dry and scaly skin. She looked very old. These symptoms disappeared within the following six months.

Pathological Examination.—On section, the lobes show a uniform structure. No cysts, no abnormal amount of colloid material. It shows a typical structure of a parenchymatous goitre. There is newly-formed gland tissue in the form of small alveoli. The follicles contain but little colloid material. The stroma is moderate in amount and fibrous in structure. In many places it is infiltrated with small round cells.

CASE XII.—Male, 45, 1904, x, 11; xi, 4. *Previous History*, negative. *Present History.*—One year ago lost health and became very nervous, with headaches and pain in the stomach. Was treated for gastric disturbance. Six months ago slight exophthalmos and tachycardia began. The left side of neck began to enlarge.

Examination.—Exophthalmos, tachycardia, nervousness. Slight tremor in hands. Hyperidrosis. Left lateral thyroid enlargement.

Operation, x, 12. Gas and ether, morphia. Left lobe and part of the right removed.

Immediate Result.—Temperature and pulse were practically normal after operation. Nervousness and palpitation diminished. Complains of severe pain in the stomach as formerly. Exophthalmos less in the right than in the left eye. No stare.

Present Result.—Three months after operation. Good health; has gained fifteen pounds. Nervousness and exophthalmos have diminished. Nervousness almost entirely. The exophthalmos more so in the right than in the left, but some is still present. Pulse, 80. No palpitation on exertion.

Pathological Examination.—A pure parenchymatous goitre.

CASE XIII.—Male, 17, 1904, xi, 1, 16. *Previous History*, always well. *Present History.*—Three years ago, palpitation of heart began, nervousness and trembling of hands. Later the eyes became prominent. Pulse, 70 to 120. Neck has enlarged greatly within the last year.

Examination.—Bilateral thyroid enlargement; soft, vascular, and uniform. Exophthalmos. Graefe's and Stellwag's symptoms present. Tachycardia; pulse-rate varies between 70 to 120; slight muscular tremor in hands. Nervousness and hyperidrosis.

Operation, xi, 2. Gas and ether, morphia. Removal of the right lobe, isthmus, and middle lobes. Ligature of the superior thyroid artery and vein of the left side.

Immediate Result.—Temperature ranged for five days between 104° and 99° F.; pulse, 130 to 90. Slight bronchopneumonia. Nervousness. Tremor was marked during this time. This condition was looked upon as a slight degree of acute thyroidism, although there was present evidences of a slight bronchopneumonia. After five days these symptoms all abated rapidly, and the patient left the hospital on the fourteenth day after operation completely healed.

Present Result.—Two months after operation. Best of health, with freedom from feeling of unrest, palpitation on exertion. Is working daily at his trade. The exophthalmos has greatly diminished, though it is still present. The “stare” is gone, and the ability to close the lids in all positions of the eye is perfect.

Pathological Examination.—Right lobe equals 11 centimetres, 5 centimetres, 4 centimetres; middle lobe equals 6 centimetres, 4 centimetres, 2 centimetres. There is a moderate enlargement of the alveoli, which are filled with colloid material. Some alveoli contain a moderate amount of blood pigment. The stroma is very vascular. In parts newly formed, gland tissue is seen in the form of small alveoli with but little colloid matter, and here the stroma is infiltrated with small round cells. Colloid parenchymatous goitre.

CASE XIV.—Female, 26, single, 1905, iii, 23; 1905, iv, 6. *Previous History*, negative. *Present History*.—Exophthalmos and tachycardia. Became very hysterical; condition gradually increased with remissions. Swelling in neck began six years ago.

Examination.—Diffuse bilateral thyroid enlargement. Circumference of neck, 33 centimetres. Exophthalmos. Tachycardia, 90 to 120. Graefe's and Stellwag's symptoms. Lungs and kidneys normal.

Operation.—Gas, ether, and morphia. Hæmithyroidectomy with ligature of superior thyroid artery and vein of remaining lobe.

Immediate Result.—No temperature. Diminution of restlessness.

Present Result.—Three months after operation exophthalmos

rapidly diminishing. Tachycardia and nervousness gone. Health perfect.

Pathological Examination.—Vascular adenomatous thyroid.

CASE XV.—Female, 25, single, 1905, v, 8; 1905, v, 20. *Previous History*, negative. *Present History.*—Six years ago prominence of eyes and nervousness with tumor of hands began. Has continued. Two years ago several patches of scleroderma and alopecia areata appeared. Has been treated in vain by medication.

Examination.—Diffuse bilateral thyroid enlargement. Circumference of neck, 34.37 centimetres. Tachycardia, 90 to 120. Graefe's and Stellwag's symptoms. Exophthalmos. Very nervous. Kidneys and lungs normal.

Operation.—Hæmithyroidectomy with ligature of the superior thyroid artery and vein of opposite lobe.

Immediate Result.—No temperature. Pulse, 90 to 110. Restlessness. Tremor diminished.

Present Result.—One month after operation. Tachycardia, nervousness gone. Exophthalmos much diminished. Health perfect.

Pathological Examination.—Vascular and colloidal goitre.

Fourteen of these patients, seen at times varying between one month and seven and a half years following their operation, are in good health, and able to work at their avocations without discomfort. They have all lost their anxiety and nervousness.

Their muscular tremor and in all but three cases their exophthalmos have disappeared. In these cases, however, though the eyes appear prominent, they are easily covered by the lids, and are free from the "stare" and feeling of distention which the patients formerly experienced. The reason for these results I believe to be due to the removal of sufficient diseased gland tissue, and where this cannot be done, the production of atrophy in that which is left. In no one of these cases has there been a return of the symptoms relieved by the operation. This is a significant fact, which substantiates Schulz's and Mikulicz's five cases with recurrence of

symptoms and relief by a second operation. The recoveries and cures are 93.4 per cent. The mortality is 6.6 per cent.

These cases comprise all those which I have been able to trace after operation, and these cases date back to 1897. Between 1887 and 1897 I operated upon six other cases, but of these I can obtain no data after leaving the hospital. Of these six cases there was one death from an acute thyroidism in 1893. The remaining recovered and left the hospitals. No trace can be obtained of these, and, though it is to be presumed that they are at least improved, still they cannot be here included. If we consider all these cases (21) operated upon between 1887 and 1905, we have 19 recoveries and 2 deaths, 90.5 per cent. and 9.5 per cent., respectively.

One of these deaths occurred during anæsthesia, and must be considered as unavoidable. It represents purely the necessary risk to be considered in these cases.

The death from acute thyroidism in 1893 I think can be looked upon somewhat differently. The symptoms of this condition bear a very direct relation to the manner and extent of operation. Where operations are prolonged and the handling of the tissues is unavoidably severe, the reaction is usually seen in this wise. In the thirteen cases above operated upon since 1896, when the technique of the operation was better understood, only one case of acute thyroidism was seen.

The operation of partial thyroidectomy compares favorably with that of sympathectomy, if we rely upon the statistics collected by Balacescu. (*Archiv für klinische Chirurgie*, Band lxxvii.) These are:

I. Division of the cervical sympathetic (Jaboulay). Eight cases, six bilateral, two unilateral. Results, 25 per cent. cured, 62+ per cent. improved, 12+ per cent. died.

II. Partial and extensive resection of the cervical sympathetic. Twenty-seven cases. Results, 33.3 per cent. cured, 40.7 per cent. improved, 7.4 per cent. failed, 18.6 per cent. died.

III. Total bilateral resection of the cervical sympathetic. Eighteen cases. Results, 55.5 per cent. cured, 27.77 per cent. improved, 11.3 per cent. recurred, 5.5 per cent. died.

I believe the case of sudden death under the chloroform should be included and not excluded from these cases. Balacescu excludes the case, and consequently has no mortality.

The best statistics here shown are the total bilateral resections, with 55.5 per cent. cured, 27.7 per cent. improved, 11.3 per cent. recurred, and 5.5 per cent. died.

Balacescu compares these cases with the results obtained in 434 cases collected by Tricomi, Starr, and Largo. These results are 30.6 per cent. cured, 44.6 per cent. improved, 10.8 per cent. failures, 13.7 per cent. died. Better statistics than these have been obtained by the operation of thyroidectomy. They are:

I. Rehn, of 119 cases collected from literature. Results, 54.8 per cent. cured, 27.9 per cent. improved, 5.9 per cent. failed, 11.4 per cent. died. Of 177 cases performed by 37 operators, results were practically the same as the above. (*Mittheilungen aus dem Grenzgebiete*, vii, 1900.)

II. Schulz (*Beiträge zur klin. Chir.*, Band xxx), 1901. Twenty cases, with 90 per cent. cured, 5 per cent. failed, 5 per cent. died.

III. Kocher. Fifty-nine cases, in which thyroidectomy was performed forty times with or without ligature of thyroid arteries or resection of other lobe. Results, 76 per cent. cured, 14 per cent. improved, 3.3 per cent. benefited, 6.7 per cent. died. (*Mittheilungen aus dem Grenzgebiete*, ix, 1902.)

The best statistics here are those of Schultz's, with 90 per cent. cured, 5 per cent. failed, 5 per cent. died. When we compare these statistics of Schulz's with those of Balacescu collected from the cases of Jonnesco, Faure, and Poignez, we find that the cures are in favor of partial thyroidectomy, and that the mortality is about the same.

There are three series of cases which will alter these statistics somewhat; they are those of Curtis, of the Mayos, and my own.

Curtis reports seven cases of bilateral total resection of the cervical sympathetic with the following results, 42.8 per cent. cured, 14.2 per cent. improved, 42.8 per cent. died. These

deaths were due to acute thyroidism and one under the anæsthetic. (ANNALS OF SURGERY, 1904, vol. xxxviii.)

If these statistics are added to Balacescu, we have 52 per cent. cured, 24 per cent. improved, 8 per cent. unimproved, and 16 per cent. died.

Curtis (*l.c.*) again reports eleven cases with 54.5 per cent. cured, 9 per cent. improved, 9 per cent. lost sight of, 27.2 per cent. died.

The Mayos report thirty-four cases, with the following results, 41.2 per cent. cured, 20.6 per cent. improved, 20.6 per cent. partially improved, and 17.6 per cent. died. (*Journal of American Medical Association*, vol. xlii.)

If Curtis's, Mayos's, and my own are added to Schulz's and Kocher's statistics, the average results are, 71 per cent. cured, 9.6 per cent. improved, 6.4 per cent. unimproved, failures, lost sight of, or partly benefited, and 12.6 per cent. died.

These statistics show that, after all, the results are about equal, but with the advantage in favor of thyroidectomy both as regards the mortality and the cures.

My object in this statistical computation is not to advocate one operation against the other, but to show that at present the results still favor the thyroidectomy.