**The present status of the surgery of systematic goitre : illustrative cases / William Seaman Bainbridge, A.M., Sc.D., M.D.**

# The Present Status of the Surgery of Systemic Goitre

## Illustrative Cases

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Definition.—The term "systemic goitre," which, so far as I am aware, has never been employed by others, seems to me to be the simplest and clearest definition of a clinical picture which is dominated by the exhibition of symptoms due to the introduction into the system of thyroid juices and toxins.

This symptom-complex, commonly known as exophthalmic goitre, Grave's disease, or Basedow's disease, may result from an increased amount of thyroid secretion (hyperthyroidism), or from the altered properties of the secretion (dysthyroidism). The entire organism is affected by the abnormal absorption of thyroid secretion. More or less marked enlargement of the thyroid gland is the usual concomitant of this condition, but this enlargement is not necessarily commensurate with the severity of the systemic symptoms.

Systemic goitre is to be differentiated from simple goitre in which, no matter how great the enlargement of the thyroid gland, there is an entire absence of thyreotoxic symptoms.

### Cases amenable to non-surgical treatment.

In a certain proportion of cases, when taken early, especially in young women, systemic goitre may be cured, or the patient restored to a fairly normal condition, by rest, topical applications of cold, the use of various sedatives, electricity, or serotherapeutic agents, notably Rogers' serum. It is not, however, the purpose of this communication to discuss the various non-surgical methods which have been suggested and employed in the treatment of this condition.

### Systemic goitre a surgical disease.

Despite the fact that some cases yield to medical treatment, pronounced systemic goitre is considered, by concensus of present-day opinion, to be a surgical disease. It is not the intention to tax the reader's time and patience with a resumé of the various surgical procedures which have been tested and discarded.

Experienced modern operators are practically agreed in recommending early radical intervention in the treatment of the vast majority of systemic goitres. The choice of the method, or the modification of the procedure, must be governed by the type and size of the goitre, as well as by a series of other considerations.

It may be stated in passing that certain procedures have been largely discarded because of their perilous nature or imperfect results. Among these may be mentioned interventions on the cervical sympathetic nerve, injections into the gland, and total thyroidectomy.

### Surgical procedures.

According to the requirements of the given case, the surgeon has at his disposal the methods of (1) *Partial Thyroidectomy, Strumectomy, Excision or Extirpation;* (2) *Intracapsular Enucleation* (of goitre nodules); (3) *Evacuation or Exenteration* (of goitre nodules); (4) *Resection;* (5) *Vascular Ligation;* (6) *Combined Procedures.*

The interventions which have stood the test of time, and which are now chiefly employed, are partial thyroidectomy and vascular ligation. The other procedures are very briefly considered.

Intracapsular Enucleation.—Enucleation of the goitre nodules, from the more or less preserved thyroid tissue, according to Socin, is feasible in all encapsulated goitres. Unfortunately, the operation in many cases is impossible without severe hemorrhage. Results with regard to recurrence are as favorable after this procedure as after extirpation of the diseased half of the organ. Paralysis of the inferior laryngeal nerve may be avoided by proper care, and an existing paresis of this nerve has

been known to subside after intraglandular enucleation.

Evacuation or Exenteration of the goitre

Fig. I.—Case I. Condition before operation. Melancholia apparent in expression.

nodules, a procedure consisting in their incision and the removal of the contents, is very rarely indicated.

Resection of the goitre is performed especially in the presence of multiple nodules, or in parenchymatous goitre, when enucleation is not called for.

Partial Thyroidectomy or Strumectomy. —Several methods of goitre extirpation or strumectomy are applicable to the diseased half of the thyroid gland, the other half being either entirely or largely healthy. In the majority of cases partial thyroidectomy is limited to the lobe of the gland which is seriously enlarged, usually the right. When it can be detached without undue difficulty, it is generally ablated in continuity with the extirpated lobe. Almost two-thirds of the goitre may be removed in this manner, without curtailing the thyroid parenchyma. Still more radical resections have their advocates, but there seems to be no real need for such extensive removal of thyroid tissue, as it is always possible, in case of recurrence, to resect the second lobe or to ligate the vessels.

Partial thyroidectomy is often simplified in systemic goitre, as compared with ordinary goitre, by the small volume of the tumor, which is rarely deep seated. However, adhesions with neighboring structures are very common. The greatest danger consists in the acute and often fatal disturbances which have been observed to follow immediately upon the operation, even when this is restricted to the very simple manipulations. Death from collapse has been known to occur within a few days or even hours, preceded by extreme tachycardia and violent excitement. Tetanic contractures are not observed, however, unless the operation has been very extensive. The pathogenesis of these symptoms has been referred either to a hyperacute thyroid intoxication, in the course of the work upon the gland (thyreotoxic theory); or to a hyper-stimulation of the vasomotor and trophic nerves of the region (nervous theory).

Bérard pointed out that the first of these theories seems to be more correct, in view of the fact that the same disturbances in modified form have been known to follow in goitre cases after the thorough brushing and scrubbing of the cervical region in preparation for operation. This thyroid massage, according to Bérard, suffices for a toxic discharge into the circulation. The accuracy of this observation has been questioned by Berry, whose large experience with these cases does not confirm the efficiency of

Fig. II—Case I. One month after operation.

rough manipulation of the gland in the production of toxic symptoms.

Provided total extirpation is avoided in stru-

mectomy, and a sufficient portion of the thyroid gland is left behind, cachexia strumipriva, a condition due to the entire loss of the organ, is not observed to follow. Provided the part which has been left behind is capable of functioning, one-fourth of the gland, or one-half of one-half of the thyroid, seems to be entirely sufficient in this respect.

Garré was enabled to re-examine over twenty of his systemic goitre cases which had been operated upon more than five years previously, almost invariably by hemilateral extirpation. There were eighty-five per cent. of recoveries, with many great improvements, and sixteen per cent. of absolute cures. No improvement was noted in fifteen per cent., including three per cent. of deaths. One patient with an enlarged thymus died on the table under general anesthesia with ether. In contradistinction to the above results of surgical treatment, the mortality percentage of medical treatment amounted to twelve per cent. in moderately severe cases, reaching twenty-three per cent. in grave cases.

In the opinion of Kausch, bilateral wedge-shaped excision of the goitre, according to Mikulicz, is preferable to unilateral extirpation (Kocher's operation), mostly on account of the better safeguarding of the recurrent laryngeal nerve and the parathyroids. With special reference to the latter, it is noteworthy that Berry, who regards the parathyroid teaching as a myth, has been for many years "in the habit of removing such portions of the thyroid gland as seemed advisable, without paying any attention whatever to the parathyroids."

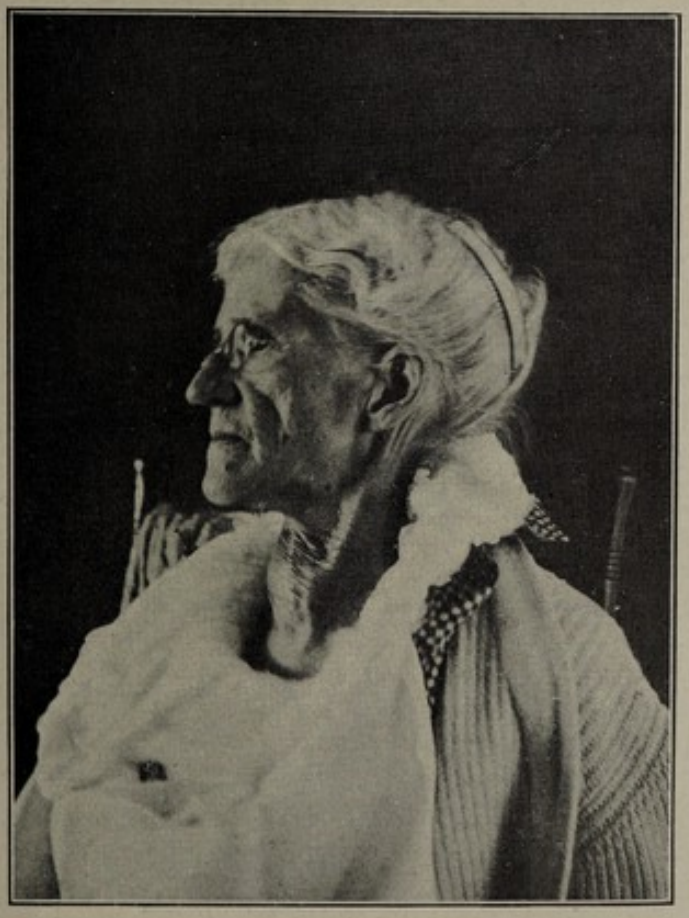

Fig. III.—Case II. Before operation, showing goitre.

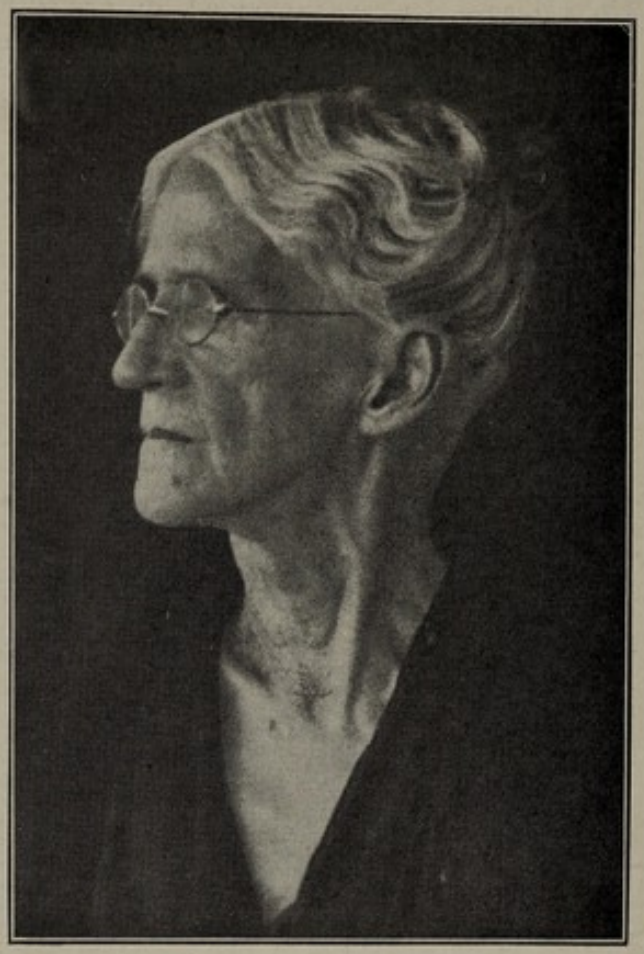

Fig. IV.—Case II. Three weeks after operation.

As a preliminary step in partial thyroidectomy removal of the thymus gland is recommended by some surgeons. A close relationship between systemic goitre and the affections of the lymphatic system, known as pseudoleukemia and Mikulicz's disease, seems indicated by some of the modern investigations. This connection is suggested by certain histological changes in these goitres, and by the demonstration of a persistent thymus in about ninety per cent. of all operations for systemic goitre. Aside from confirmatory findings in experimental investigation, such a connection is indicated by the operative results obtained by Coenen, who secured marked improvement in a case of systemic goitre through the removal of the persistent thymus gland. Spijarny, who holds that a persistent thymus is found in eighty-two per cent. of the deaths from systemic goitre, considers this a contraindication to the operation. In patients who die after goitre operations, persistency of the thymus is noted in a very high percentage of cases.

There is thus a tendency to credit a persistent thymus with a considerable part in the pathogenesis of systemic goitre. It is important, therefore, that this factor be borne in mind in the treatment of the disease.

## Vascular Ligation.

Ligation of the superior and inferior thyroid arteries, on one or both sides, in one or several sessions, has been recommended in order to induce atrophy of the goitre, especially in the rapidly growing parenchymatous goitres of youthful individuals, or in cases of systemic goitre. Ligation is also used as a preliminary operation with the hope of improving the condition enough to allow a more radical operation at a later time. Kocher never ligates more than three thyroid arteries, on account of the danger of cachexia when the four arterial vessels are obliterated. The method of ligating several arteries in these cases was considered by its originator, Mikulicz, as a more difficult and dangerous operation than thyroidectomy. Aside from the danger of the intervention itself, the thyroid arteries must be tied at the same time, to insure maximum efficiency; for, instead of being terminal vessels, these arteries freely communicate through anastomosis between themselves, and through collateral circulation with the arteries of the vicinity.

In severe cases of systemic goitre, successive ligation of first one and then another artery

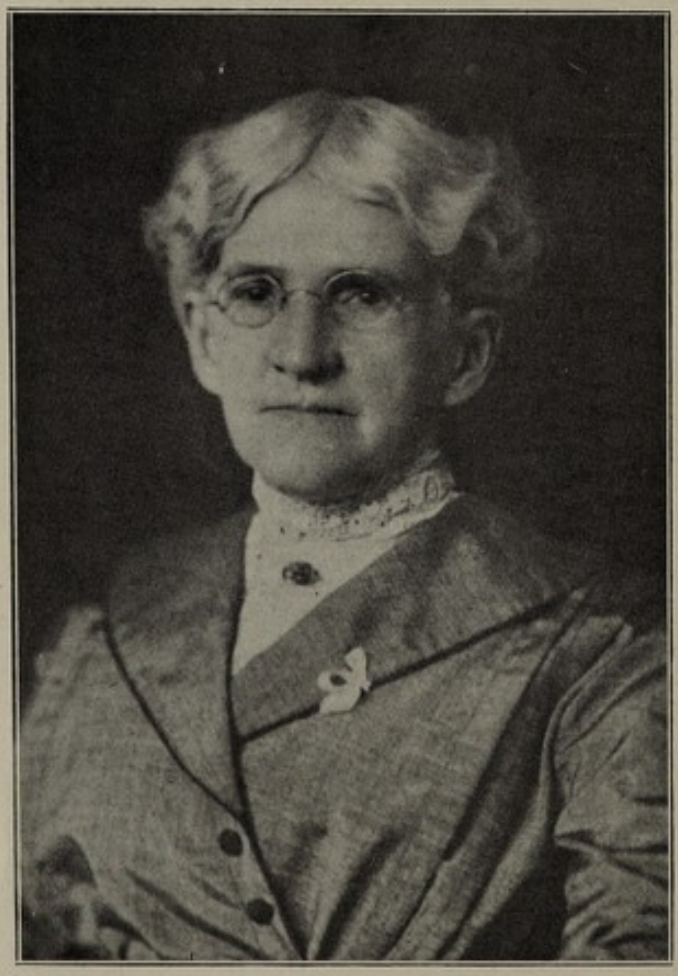

Fig. V.—Case II. One and a half years after operation.

may be applied under local anesthesia. Being more accessible, and not related to any important nerves, the superior thyroid arteries are usually selected for the ligature. According to Berry's observations, the inferior is nearly always a much larger vessel than the superior thyroid. Ligation of the inferior thyroid is a

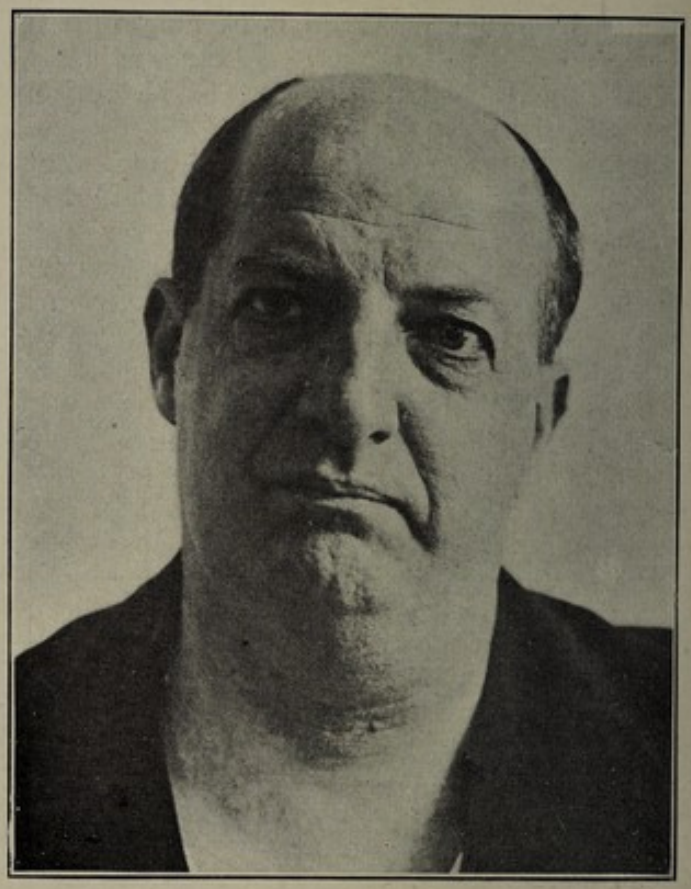

Fig. VI.—Case III. Before operation.

very difficult and rather severe procedure, which should be reserved for special cases. The place of selection for the ligature is directly internal to the point where the thyroid artery crosses the common carotid. The ligature is applied flush with the carotid, at a distance from the gland, and therefore from the recurrent nerve. The chief difficulty is referable to the chronic inflammation of the tissues surrounding the goitre.

Ligation of one or more arteries acts, in the opinion of Bérard, not only by cutting off the nutritional supply of the gland, but undoubtedly also by affecting the metabolism through the exposure, sketching, and tying of the concomitant nerves of the vessels. The goitre is rarely large enough to interfere with the exposure of the arteries.

Successive ligatures were applied by Kocher in order to avoid all danger of myxedema. In 1895 he published thirty-four observations with thirty-one cures or improvements, and three deaths (one not due to the operation). At the German Surgical Congress in 1895, Rydygier compared his results with those of Kocher. By the ligation of the four arteries in a single session he obtained among twenty-two cases, twenty cures or improvements. There were two failures, without any serious complication, tetany or myxedema. In the experience of

Weinlechner, tetany has been known to follow upon the ligation of the two superior thyroid arteries.

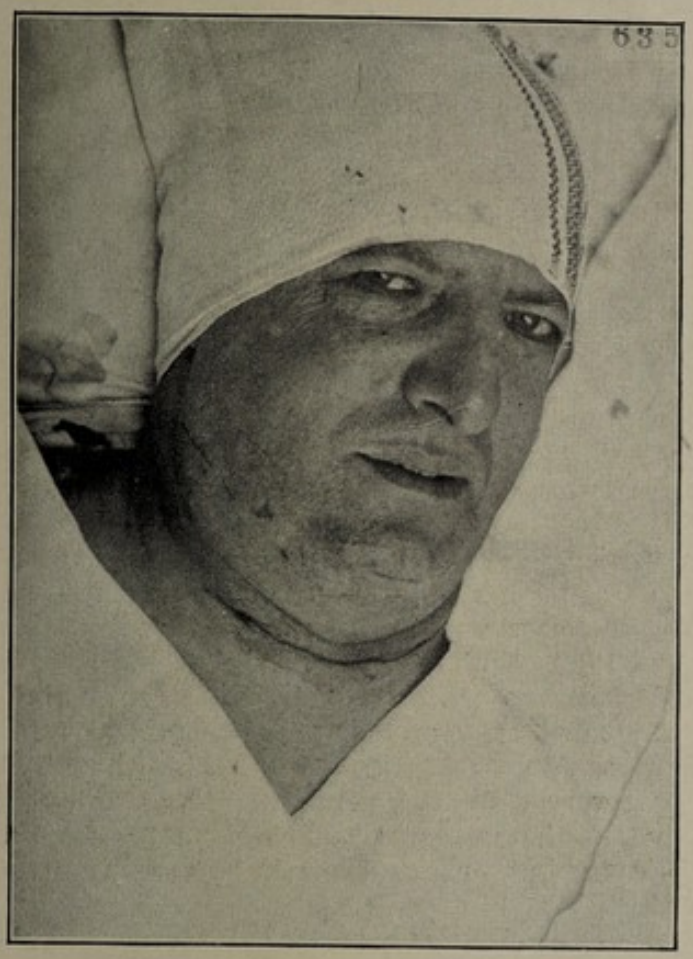

Fig. VII.—Case III. Immediately after operation. Wound sutured, ready for dressing.

Bilateral ligation of the inferior thyroid arteries, with resection of the right sympathetic nerve, was performed by Patel and Leriche, in the case of a woman twenty-six years of age. The large goitre diminished in size, but soon increased again, and six weeks later the right half of the thyroid was extirpated. The patient rapidly succumbed to cachexia, within three weeks of the operation, and at autopsy a thymus gland the size of a walnut was found, although clinically the case was not one of thymus death. The mortality of vascular ligation, both single and double, in the worst types of the disease, in Mayo's experience fully equalled or exceeded the mortality of thyroidectomy.

According to Mayo, the method of ligation now has an accredited position in the treatment of systemic goitre. He states that patients seen in the early stages are sometimes wonderfully improved by the simple operation of double ligation. In mild cases, or when the patient is operated upon at an early date, ligation of the blood and lymph vessels is recommended by him in the treatment of hyperthyroidism. This intervention serves to prevent the production as well as the outpouring of the secretion, and a complete cure frequently follows.

The same is adopted by a number of operators in the very grave cases, which are thereby essentially improved, so that the larger lobe with the isthmus can be removed later under more favorable conditions. The general health is often greatly benefited by the ligation, and the patients gain in weight.

SELECTION OF OPERATIVE METHOD.

The unilateral type of systemic goitre always affords favorable prospects for operative interference. In a general way, after the patient has been prepared by improving the general condition, three-fifths of the goitre may be removed.

Kocher, in a recent contribution, emphasizes that operative procedures are not only permissible, but positively indicated in all goitre cases where an increased function of the thyroid gland can be demonstrated by clinical observation and examination of the blood. Two or three of the main arteries may be tied, first on one side, then on both sides. In case the result is not sufficient, a portion of the goitre may be extirpated in the third session. One-half of the gland or the more considerably enlarged lateral lobe, may be removed, practically always with the certainty that not too much has been ablated, and without risking the onset of symptoms due to loss of thyroid function.

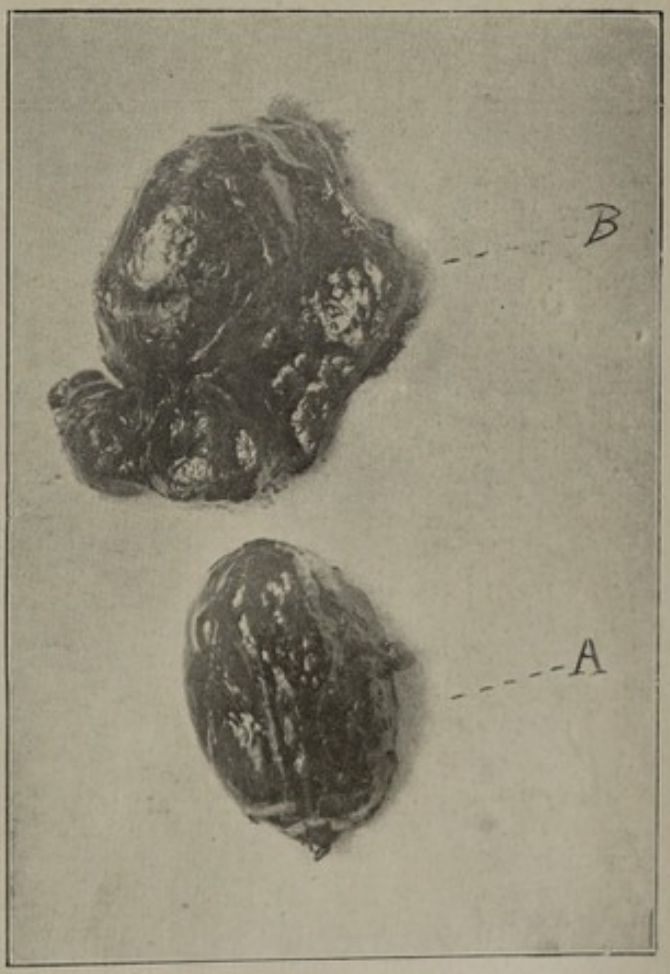


Fig. VIII.—Case III. A. left lobe of thyroid. B. growth from isthmus—mediastinal goitre.

Vascular ligation and partial thyroidectomy have been combined in such a way that uni-

lateral excision is performed with ligation of an artery of the opposite side. This procedure is advocated by Landstroemme. In recurrent

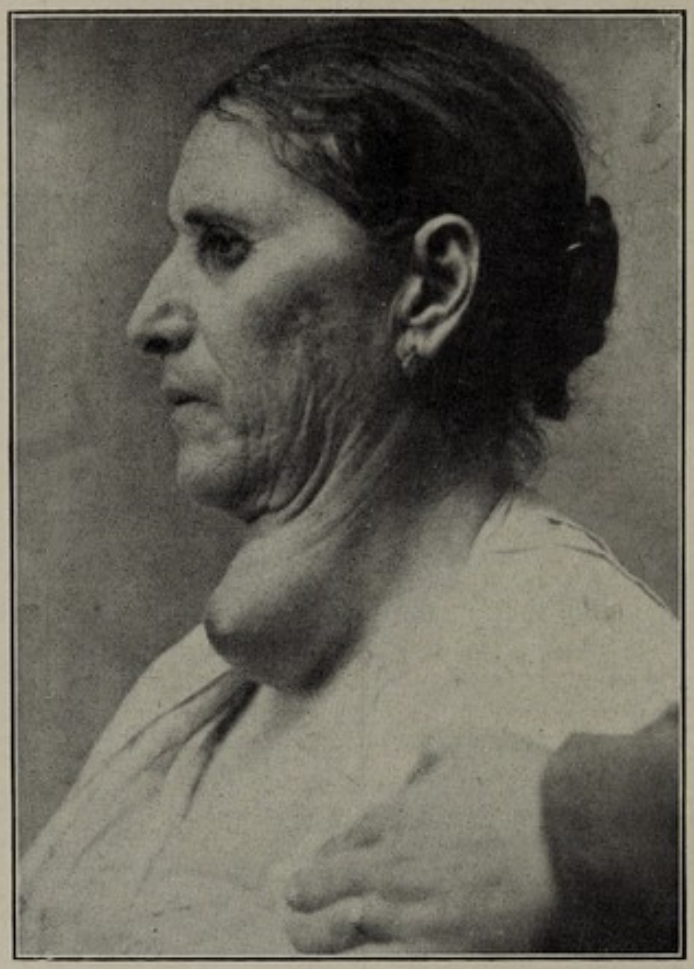

Fig. IX.—Case IV. Before operation.

goitres an attempt may be made to induce atrophy of the remaining lobe through application of a ligature around one or both of the remaining arteries. If the reaction after the ligation of the vessels at the left upper pole be not severe, the right lobe, the isthmus, and possibly a portion of the left lobe, are removed by Mayo at a second operation.

In thirty-two cases of systemic goitre, cured by operation, reported by Klemm in 1908, the intervention always consisted in excision of the diseased half of the gland. Where the entire gland was affected, the excision was combined with ligation of the vessels of the opposite side. The operation was invariably performed in one session, under local anesthesia.

As a surgical curiosity, the anastomosis of the central end of a thyroid artery with the peripheral end of a thyroid vein has been suggested, in selected patients, with the object of diminishing the goitre without a strumectomy. Although the operation is hardly easier than strumectomy, it is claimed to offer the advantage of better avoidance of operative complications, especially injury to the recurrent nerve.

## OPERATIVE RESULTS.

In eleven cases of systemic goitre reported by Krueger in 1908, vascular ligatures were applied, under general anesthesia, in three instances, with one death. Partial strumectomy was performed in the eight remaining cases, always with radical improvement.

Mayo's goitre operations exceed two thousand in number, and contain series of seventy-six to ninety cases without a death. About seventy per cent. of the patients consider themselves as entirely cured. In a recent contribution (1912) he reported having operated on a consecutive series of 278 cases of exophthalmic goitre without a death.

Early interventions upon ordinary goitres have so low a mortality as to render this danger practically negligible at the hands of skilled operators. In case of the combined procedures, as well as in simple strumectomies, the operative mortality has been extraordinarily diminished of recent years. Jaboulay has not lost a patient operated upon for benign goitre since 1900; and Bérard operated with the same success on a series of eighty-five cases between 1900 and 1908. Kocher's record of his fifth thousand of goitre operations in the Bern Clinic, completed on March 11, 1912, stands as follows: Among 603 uncomplicated, although in part very difficult goitres, there was no death due to the operation. The same remark applies to nineteen operations for recurrent goitres, which are apt to prove especially difficult on

Fig. X.—Case IV. One year later.

account of cicatrices or adhesions. Of 26 excisions in malignant goitre, all patients were cured. Thyroid operations, when properly per-

formed, lead usually to a cure or at least to an improvement of systemic goitre, in the experience of Kocher. Definite end-results could be compiled in 320 operative cases, recently reported by this authority (1912). A complete cure was obtained in 150 of these patients, while 148 still present individual symptoms of the disease, such as protuberant eyes or functional disturbances of thyroid origin, but with marked general improvement. The outcome was unsatisfactory in only 22 cases, either because the operation could not be completed, or on account of recurrence, in five per cent. of the cases; or because secondary disturbances on the part of the kidneys or the liver failed to subside after the goitre operation.

Concerning permanent results of operative treatment of systemic goitre, Weispfenning (1912), writing from the First Surgical Department of the Hamburg-Eppendorf General Hospital, Service of Professor Kümmell, points out that the cases operated upon during 1889 to 1900 have already been re-examined twice, first by Schulz, in 1905; then by Friedheim, in 1911. The re-examination of Schultz covered twenty cases, the longest interval since the operation being eleven years, the shortest one and one-quarter years. In eighteen of these twenty cases, the operation proved to have been

Fig. XI.—Case V. Before operation.

perfectly successful; of the remaining two cases there was one failure and one death. The nineteen survivors were again examined by Friedheim, nearly five years later, showing permanent cures in fourteen cases; marked improvement in two cases; and moderate improve-

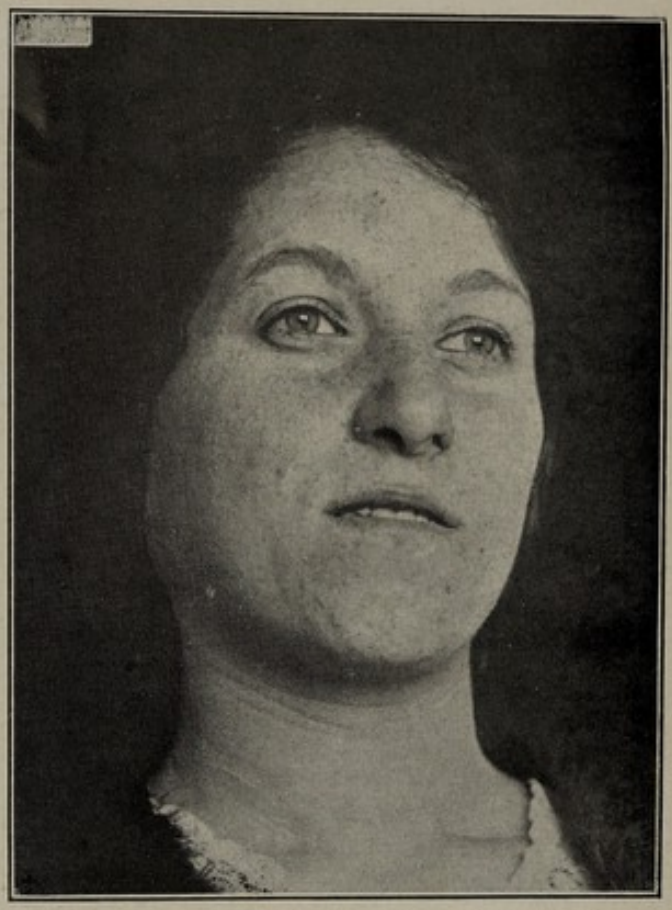

Fig. XII.—Case V. One month after operation.

ment in three cases. The fourteen cures must be considered permanent, as, in the last case operated upon, four years had elapsed at the time of the re-examination. Of these nineteen case, five were examined for the *third* time by Weispfenning, who also carried out the first re-examination in eleven of fifteen cases operated upon from 1900 to the beginning of 1910. The sixteen re-examined cases are divided by him into four groups, according to results:

(1) Permanent cures, four cases.
(2) Temporary cures, three cases.
(3) Improvements, two cases.
(4) (a) Recurrences, five cases.
(b) Cases with goitre of the side not operated upon, two cases.

In thirty-five operative cases, the findings in 1911 were:

Permanent cures, fifteen cases, forty-three per cent.
Temporary cures, three cases, eight per cent.
Improvements, two cases, seven per cent.
Recurrences, seven cases, twenty per cent.
Deaths, three cases, eight per cent.
Not re-examined, five cases, eight per cent.

The operation in all cases had an immediate beneficial result. In some this became permanent. In others it proved transitory, either because of a recurrence, or of the subsequent development into a goitre of the part of the

thyroid which had been left behind. In the latter event the hyperthyroidism which the operation had temporarily relieved returned

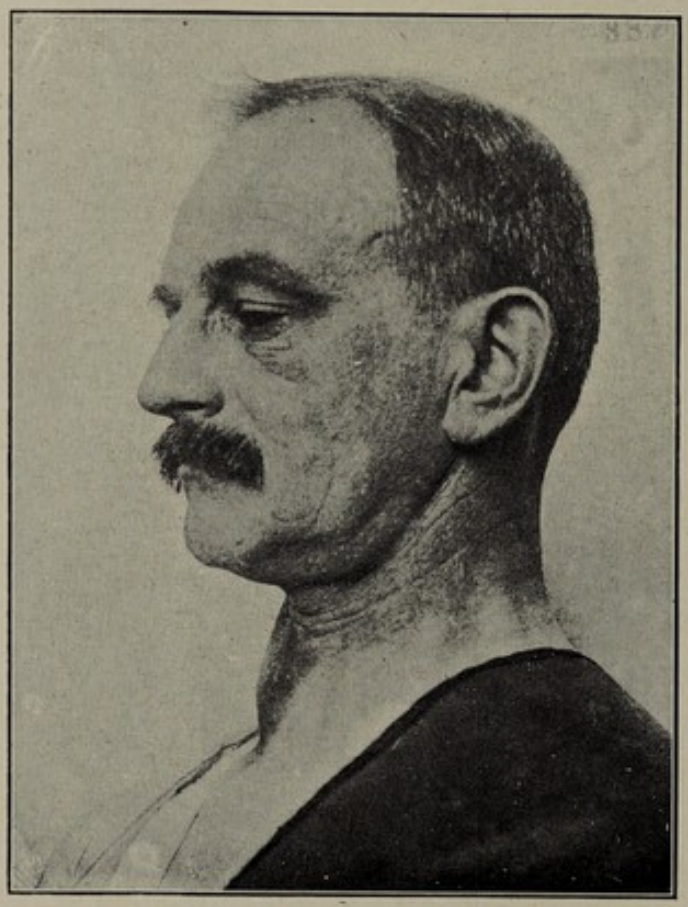

Fig. XIII.—Case VI. Condition before operation.

sooner or later after the interference, eliciting in part or entirely the typical objective and subjective symptoms of the disease. This outcome of operative intervention again corroborates the belief of Kocher, Kümmell, Mayo, and other experienced operators, in the efficiency of surgical procedures in systemic goitre, the operation to be performed at the earliest possible moment, while the disease is still in its incipiency.

In the Mayo clinics, during the years, 1905, 1906 and 1907, two hundred operations were performed for hyperthyroidism. Of this number, twenty-two were males and one hundred and seventy-eight females. Ten patients died as the result of the operation. Letters were sent to the remaining one hundred and ninety and answers were received from one hundred and sixty-seven. Of these, one hundred and sixteen, or 70 per cent., were cured; thirty-two, or 19 per cent.. improved; ten, or 5.8 per cent., slightly improved; nine, or 5.2 per cent., not improved.

Klose's compiled statistical material from several large clinics with altogether two hundred and ninety-eight cases (1911) shows:

191 cases, sixty-four per cent. cures. (Two to eighteen years).

72 cases, twenty-four per cent. improvements

7 cases, three per cent. not cured.

6 cases, two per cent, recurrences.

22 cases, seven per cent. deaths.

Concerning the functional results after the various operative procedures, the dyspnea and dyshagia which most frequently require intervention, are amenable to improvement, provided these symptoms are due to the goitrous enlargement itself. Nearly asphyxiated patients not uncommonly regain free and easy respiration on the day of the operation, and such favorable results are noted in about three-fourths of the cases. Difficulty in swallowing is apt to persist and even increase during the first week following the operation, after which time it gradually subsides.

As soon as the operation has stopped the hypersecretion of the thyroid gland and removed the obstruction of the return circulation, there is usually an end of the cardiovascular disturbances, such as tachycardia, palpitation or persistent edema of an upper extremity. The results are not so positive when the structure of the myocardium has been affected, although even in these cases there is often a striking improvement. Together with the regulation of the heart action and the subsidence of the chronic pulmonary congestion, the functions of the other organs are also improved, in consequence of the better blood supply. Aside from exception-

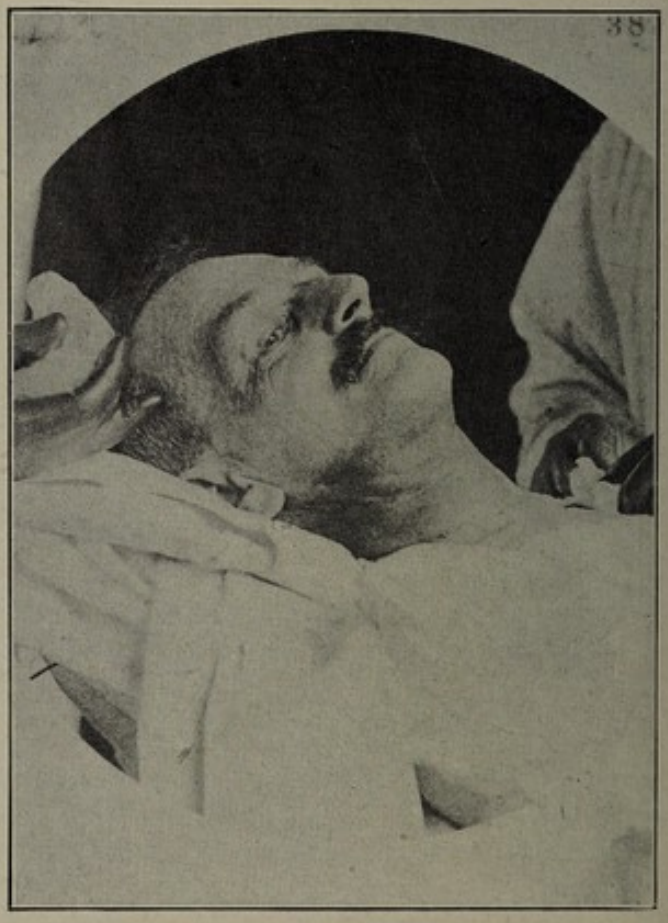

Fig. XIV.—Case VI. Operation complete. Wound sutured. ready for dressing.

ally unfortunate cases, in which myxedema follows even on limited resections, the signs of thyroid insufficiency gradually subside, the re-

maining lobules of the gland assuming increased activity.

With special reference to nervous disturbances, the recurrent nerves, being in closest contact with the goitre, are apt to be profoundly altered by it. In some cases, where the muscles of the larynx had not become entirely atrophied, the removal of the thyroid swelling has been known to relieve even total laryngoplegia. In several observations of Roux and of the author, the patient's hoarse and goitrous voice became perfectly normal after the operation. Bérard noted two cases in which the ablation of the goitre relieved neuralgic disturbances of the upper extremity, with incipient atrophy of the muscles of the shoulder.

The cases of improvement after operative treatment, according to Friedheim, illustrate the importance of correct dosage of the part of the goitre that is left behind. In some of his cases, a goitre was again present at the time of the report, so that a cure was still to be expected from a second or third operation. His investigations were made upon a series of twenty cases of systemic goitre, from the clinics of Kümmell, which were treated by enucleation or resection of a portion of the goitre. Later reports could be secured from sixteen of these patients. Fourteen were found to be cured, no trace of the goitre being left. There were two marked improvements, three moderate improvements, and one death due to tetany, ten days after the operation. At the time of the report the fourteen permanent cures covered periods of from four to fifteen years after operation.

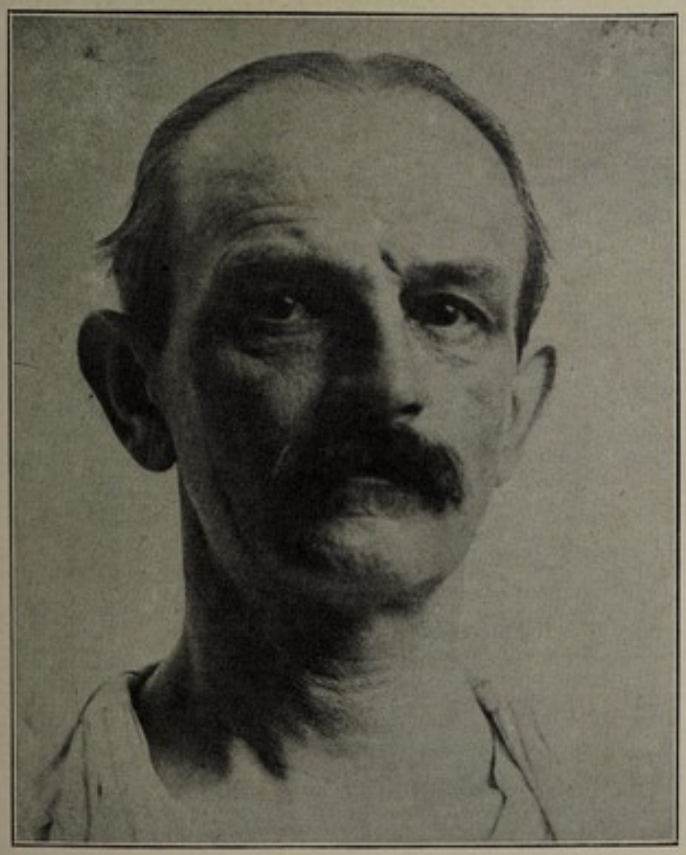

Fig. XV.—Case VI. Two months and a half after operation.

In reporting the results of surgical treatment in systemic goitre before the French Surgical

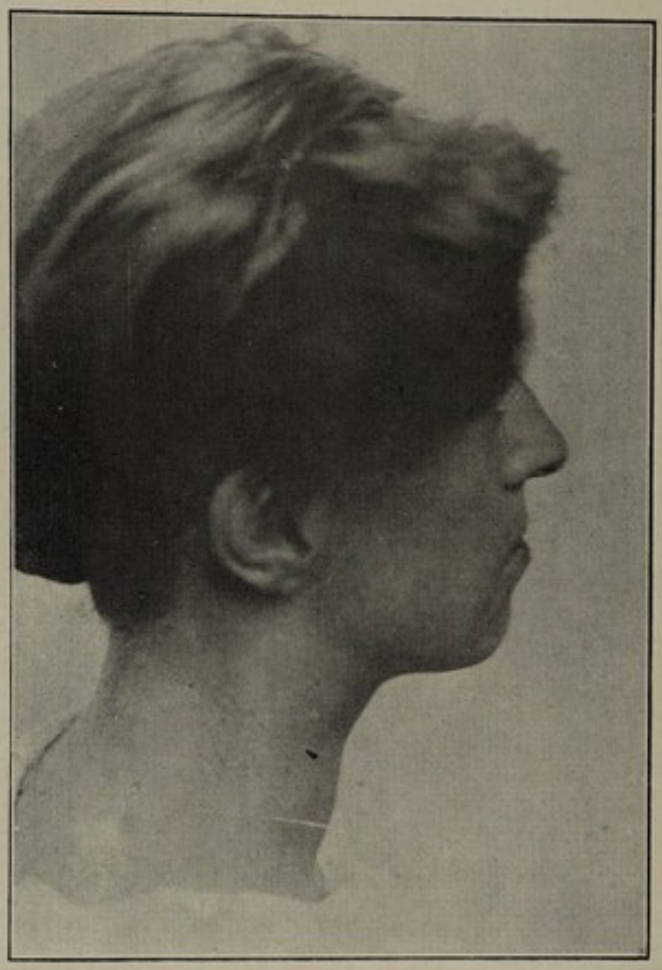

Fig. XVI.—Case VII. Before operation.

Congress, in 1910, Delore and Lenormand state the following figures: Internal treatment yields twenty to twenty-five per cent. cures, ten to twenty-five per cent. mortality. Surgical treatment of the thyroid itself has a mortality of from zero to seven per cent., average four per cent., as calculated for about fifteen hundred operations. Cures, seventy-five per cent., according to Kocher; fifteen per cent., according to Garré. Including the great improvements with the cures, there are six hundred and sixty-six favorable cases, as compared to one hundred and seventy-four slightly improved or recent cases, and sixty-three deaths due to operation. Since the publication of this report, the operative mortality has been strikingly diminished.

## SUMMARY.

It may be said that the internal or medical treatment of goitre and other affections of the thyroid gland has failed to show results even approaching those realized by the handiwork of the surgeon. The organo- and serotherapeutic results are often of only limited duration, and even in the most favorable cases frequently require periodical repetitions of the treatment, for the maintenance of the improvement. Per-

manent cures in the grave forms of the disease are very rare. On the other hand, with modern methods of technic and the proper care before

Fig. XVII.—Case VII. Three and a half years afterwards.

and after operation, the surgical mortality is exceedingly small, while a more or less prompt or progressive improvement, approaching a cure in the majority of cases, is usually obtained by modern goitre operations.

ILLUSTRATIVE CASES.

The following brief histories, with pictures, selected from a large number of cases operated upon by different methods, according to requirements, illustrate some types of operative technic and results. Elsewhere I have dealt with other phases of the subject. (See bibliography).

Case I.—G. female, aged 55.

*Symptoms.*—Gradually growing worse for some years. Nervous, rapid heart, tremor, general weakness; enlarged and throbbing neck. At times so depressed as to appear to be a typical case of melancholia.

*Operation,* July, 1912. Partial thyroidectomy, right half, and a small portion of left upper pole removed, under local anesthesia. Recovery uneventful. Gradual gain in nervous and physical strength. All melancholia disappeared. Perfectly well February 14, 1914.

Case II.—W., female, aged 68. Referred by Dr. James A. Babbitt, of Philadelphia.

*Symptoms.*—Slight goitre at 17, which disappeared. Three years ago neck gradually grew larger, until there was absolute loss of voice; marked cyanosis at times; frequency of heart action; nervousness; some tremor.

*Operation,* August, 1912, under local anesthesia. Removal of right lobe and isthmus. A part of the goitre was markedly calcareous. Recovery uneventful. Within a few days voice began to return. Perfectly well, February 14, 1914. Voice normal, no cyanosis. Practically all symptoms relieved.

Case III.—G., male, aged 48.

*Symptoms.*—Markedly nervous; rapid heart; at times extreme dyspnea, with cyanosis; unable to walk upstairs. Getting steadily worse for some months, unable to work, practically an invalid. Definite hyperthyroidism, but also marked local symptoms from displacement of the trachea one and one-half inches to the right, and softening of several of the tracheal rings by pressure.

*Operation,* February, 1913, under local anesthesia. General anesthesia absolutely contraindicated. Left lobe of thyroid, (Fig. VIII-A), and a growth from the isthmus, (Fig. VIII-B), more than twice the size of the enlarged lobe, removed. Uneventful recovery. Back at work. Well.

Case IV.—C., female, aged about 48. Referred by Dr. W. H. Cantle, of Mamaroneck, N. Y.

*Symptoms.*—Nervousness and tremor.

*Operation,* November, 1912, under local anesthesia. Enormous bilateral goitre, with colloid and cystic degeneration. Inflammation involving the skin. Partial thyroidectomy on each side, including the isthmus, which was markedly degenerated. It was possible to leave a small portion of lower pole of each

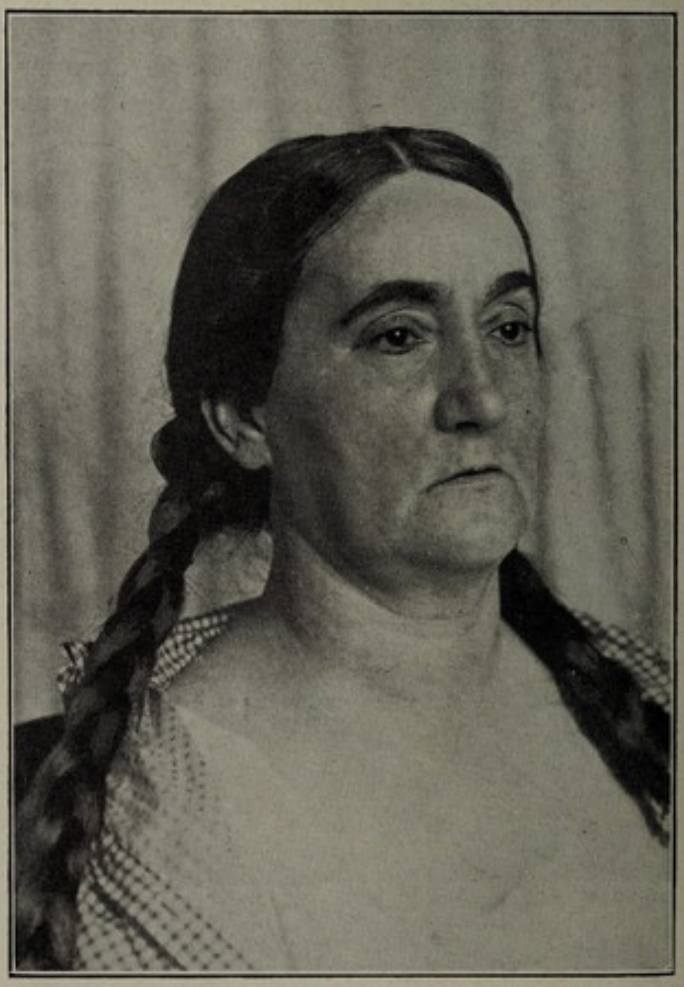

Fig. XVIII.—Case VIII. Before operation.

lateral lobe. Recovery uneventful. Perfectly well February 1, 1914.

Case V.—B., female, aged 25.

*Symptoms.*—Difficulty in swallowing. Enlarge-

ment of neck for several years. Nervousness, palpitation, throbbing in neck.

*Operation*, December, 1913, under oil-ether rectal anesthesia. Right lobe removed. A preliminary of ⅙ gr. morphin, 1/150 gr. atropin, one-half hour before operation. Six ounces of a seventy-five per cent. solution of ether in oil, administered by Gwathmey's method. Anesthesia entirely satisfactory in

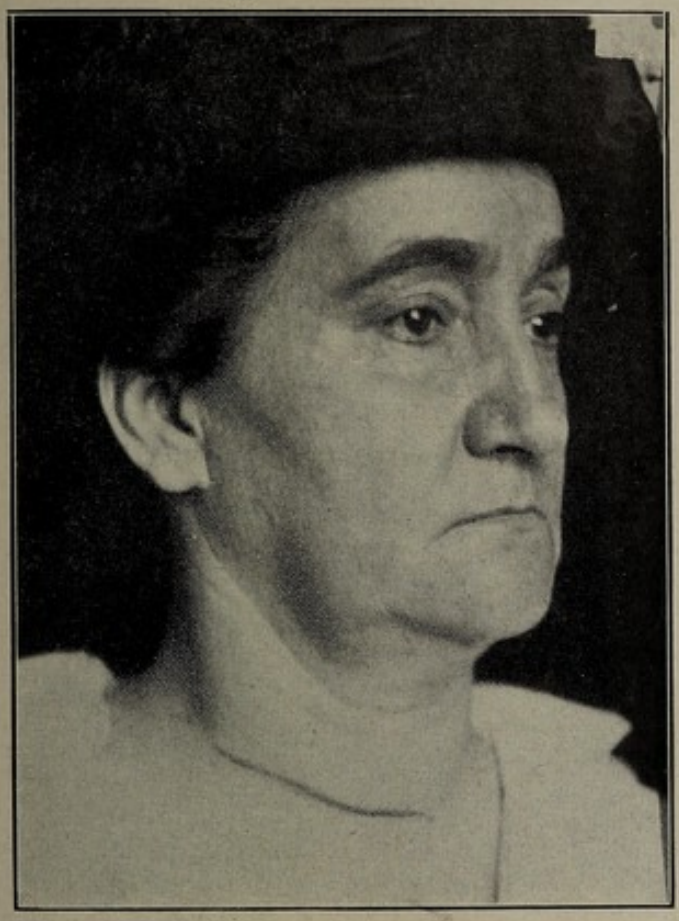

Fig. XIX.—Case VIII. One month later.

fifteen minutes. Recovery uneventful. Considers herself well.

Case VI.—W., male, aged 47.

*Symptoms.*—For some years had had persistent cough, with sensation of choking. Was advised by family physician to go south for what was diagnosed as early pulmonary tuberculosis. Five weeks before consulting me a small swelling was discovered in the lower part of the neck, right side, which the physician pronounced a tuberculous gland. Upon examination a very small goitre was found. Slight hyperthyroidism, but marked general depletion from constant coughing and anxiety over his supposed tuberculosis condition.

*Operation*, February, 1912, under local anesthesia. Small goitre, right lobe, lower pole, removed. This enlargement was so situated as to be far down, easily escaping detection. It rested directly upon the recurrent laryngeal nerve. Recovery uneventful. Cough ceased after operation. Perfectly well, February 1, 1914.

Case VII.—R., female aged 20.

*Symptoms.*—Had had goitre symptoms for thirteen years. Marked nervousness; tremor; exopthalmos so great that eyelids could hardly be made to cover the eyeballs; pulse between 130 and 150; unable to do any work; practically an invalid.

*Operation*, July, 1910, under local anesthesia. Complete removal of right lobe, and upper part of left lobe. Recovery uneventful. Perfectly well, February 1, 1914. At work as professional singer and dancer.

Case VIII.—W., female, aged 52.

*Symptoms.*—Swelling in neck for twenty-three years, but so slight could hardly be detected. Headache for ten years. At times distinctly short of breath, choking sensation, palpitation, cyanosis, nervousness, eyes abnormally protuberant. Distinct picture of hyperthyroidism, with hardly perceptible goitre.

*Operation*, April 1913, under local anethesia. Mass in right lobe enucleated. Ligation of superior thyroid, left side. Recovery uneventful. Perfectly well, February 1, 1914.

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