



Adenoma of Thyroid

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I. CASE REPORTSINTUSSUSCEPTION

Dr. Roy C. Ainsworth

CASE I.

_____ - male, age 5½ months, admitted to University of Minnesota Hospitals on evening of 4-10-35.

History

Baby perfectly well until 10 A.M., 4-9-35, when feeding was regurgitated and patient was restless and irritable.

3 P.M. - 4-9-35 - Cried out with pain. All food given by mouth vomited up.

4 P.M. - 4-9-35 - Stool containing fresh blood. Three subsequent stools until 11 P.M., all containing blood. None since. Intermittent pain which wakes baby up.

Physical findings

Well-nourished and well-developed. Abdomen - no rigidity, small mass in right upper quadrant and suggestive emptiness in right lower quadrant. Rectal - no masses or blood.

Laboratory

Urine - negative. Blood - hemoglobin 75%, leucocytes 11,450, neutrophils 19%, lymphocytes 78%, monocytes 2%, eosinophiles 1%. Wassermann negative. X-ray - Barium enema shows characteristic intussusception in hepatic flexure which on pressure was reduced to cecum but could not be completely reduced. Abdominal mass not palpable following barium enema.

Operative findings

Ileocolic intussusception found with appendix in intussusception. Easily reduced by gentle pressure. Appendectomy performed because of hemorrhagic character of appendix.

Postoperative course

Uneventful excepting for some weight loss and anorexia.

CASE II.

_____, - age 3, entered University of Minnesota Hospitals at 9 P.M., 4-7-35 and expired 4 A.M., 4-19-35.

History

Patient awakened at 8 A.M., 4-6-35 with cramp-like pain in abdomen. This became intermittent every 3 to 5 minutes with relief and sleep in between. No vomiting or bowel movements. Enema given at 11 A.M. with return of hard fecal material. 8 P.M., On this day, a mass was felt by the local physician. 9:30 P.M. - Enema with return of bloody water. Temperature normal.

4-7-35 - Vomited water in A.M. Patient admitted to hospital 36 hours following onset of pain.

Physical examination

Well-developed and well-nourished, 3 year old girl. Skin slightly dry. Abdomen - sausage-shaped mass in right lower and upper quadrants; no rigidity; intermittent abdominal pain. Rectal - no masses or blood. Admission temperature 99.6. Pulse 180. Respirations 45.

Laboratory

Blood - leucocytes 30,000, hemoglobin 75%, neutrophils 78%, lymphocytes 19%, monocytes 3%. Urine - negative. X-ray: Flat plate of abdomen shows considerable gas in small bowel suggestive of obstruction with no gas in large bowel. Barium enema shows extensive defect at hepatic flexure and ascending colon characteristic of intussusception. Barium extends beyond area of defect into base of cecum, but could not be forced through the ileocecal valve. Mass was decreased in size following barium enema.

Operation

Right rectus incision. Excess of free fluid in peritoneal cavity which was somewhat hemorrhagic. Terminal ileum found to be invaginated into the colon; appendix outside, designating condition either as an ileocolic or compound ileocolic intussusception. Attempts at reduction failed. The appearance of

terminal ileum at site of invagination suggested that bowel within was gangrenous. Terminal ileum about one foot above intussusception anastomosed to transverse colon near hepatic flexure. Acacia given during operation and transfusion immediately following.

Postoperative course

Temperature ranging between 102 and 103, reaching 106 on 4th postoperative day with gradual drop to 100 on 7th day. Patient carried on paraoral fluids and nasosuction. Transfusions on 5th and 11th postoperative days. Patient irrational until drop in temperature on 7th postoperative day.

4-14-35 (8th postoperative day) - Foul discharge from wound. Milk culture shows stormy fermentation. Polyvalent gas gangrene antiserum given intramuscularly (1/3 ampule). Wound irrigated with Dakin's solution.

4-16-35 (10th postoperative day) - 8 P.M. - Loop of bowel found protruding from lowermost portion of incision. Strapped with adhesive and rubber dam placed over incision.

Patient's temperature begins to climb, reaching 102 by midnight on 4-19-35. Steady increase in pulse and temperature until expiration at 3:45 A.M., on 13th postoperative day.

Autopsy findings

1. Intussusception as described.
2. Peritonitis
3. Intact anastomosis.

II. ABSTRACT

INTUSSUSCEPTION IN INFANCY AND CHILDHOOD

Dr. Roy C. Ainsworth

Report of 372 cases.
Wm. E. Ladd and Robert E. Gross.
Boston Children's Hospital,
Arch. of Surg. 29, #3: 365
(Sept.) 1934.

Twenty-five year period: 1908-1932 -
372 cases of intussusception encountered.

Incidence

87% in children under 2 years.
70% in children between 4 and 11 months.

61% boys - 39% girls.

Most frequent in well developed and well nourished children.

In only 5% of series was causal factor detected.

14 cases by inverted Meckel's diverticula.

2 cases by intestinal polyps.

1 case by enterocyst.

1 case by lymphoma of ileum.

7 cases sequel to dysentery or infectious diarrhea.

Types

Ileo-ileal (enteric)	7%	
Ileocolic	75	
Ileo-ileocolic	9	
Colocolic	1	
Retrograde		1 case
Multiple		3 cases

Symptoms

Sudden onset of symptoms.

Typical case - Infant in excellent health suddenly cried out in severe pain, "doubled-up", turned pale, sweated and vomited soon afterward. Paroxysm lasted a minute or two and was followed by a period of relief. Attacks at intervals of 10 to 15 minutes.

In this series: 82% had pain
90% vomiting
High % of sweating and pallor

Fever less common and if present indicative of long-continued vomiting and dehydration.

88% in stools
within 24 hours.

First stool usually normal, later stools contained mucus, mucus and blood or unmixed blood.

Physical findings

Well-developed and well-nourished

child. Dehydration with longstanding vomiting. Marked shock in 1/10 of cases. 84% cases - mass in abdomen.

Usually a discrete, rounded or sausage-shaped tumor, firm and usually not tender. Occasionally felt to increase in hardness during pain attacks. Majority along course of colon. Dance's sign: "empty" right lower quadrant because of invagination of cecum into colon.

In 10 cases, tumor felt only after patient anesthetized. 28% of cases show mass of general shape of adult cervix uteri felt on rectal examination. Bimanual examination with child held in sitting position has been recommended.

Four cases of intussusception protruded from the anus. Differential diagnosis from prolapsed rectum made by passing finger into rectum; in prolapse of rectum, there being no space to admit finger. In 50% of the cases, blood was noted on the finger after rectal examination.

X-ray examination

Not necessary in most cases.

Barium enema with fluoroscope valuable aid in typical observation of ileocolic type.

1. Obstruction to injection of barium.
2. Cupola effect or cupping in head of barium as it met the intussusception.
3. Thin cylindrical shell of barium around intussusceptum (and inside intussusciens).
4. Possibly a palpable tumor at site of obstruction.
5. A remaining cylindrical shell of barium surrounding and outlining the intussusceptum after evacuation of enema.

Treatment

Hutchinson (1874) performed first abdominal section with successful reduction and since treatment has tended toward operative intervention.

Reduction by colonic injection of fluids has been advocated.

Arntzin and Helsted, Retan and Stephens advocate reduction by a barium enema under fluoroscopic observation.

The authors are opposed to these methods because operation is delayed and the child is subjected to a procedure which depletes its narrow margin of reserve, and where practiced a considerable number of cases come to operation because of irreducibility or to make certain that complete reduction has been effected. They believe that by limiting themselves to operative treatment the mortality has been reduced.

Types of operations

1. Reduction by "taxis" (83% of cases, mortality 12% in past 5 years).
2. Resection with anastomosis.
3. Resection with double enterostomy (Mekulicz). Authors favor this type when necessary.
4. Removal of intussusceptum through incision in intussusciens.
5. Anastomosis around mass, leaving intussusceptum to slough out.
6. Anastomosis around mass and resection of intussusceptum at a second operation.
7. Ileostomy with resection at a second operation.

Mortality in series covering 25 years:

59% in first 5 years.
14% in last 5 years.

Factors in Mortality

Reduction of time between onset of symptoms and operation.

Greater attention to postoperative care.

Farther mass has progressed toward anus, the higher was the related mortality.

Degree of temperature of prognostic value; with temperature above 100 and 101 expectancy of death rose rapidly.

Postoperative temperature 102 to 104 not unusual but above 105 grave and

usual fatal prognosis.

Postoperative complications: Shock, dehydration and toxicity caused 4.5 of death and thus 85% occurred within 48 hours.

Peritonitis caused 6 deaths.

Bronchopneumonia caused 5 deaths.

Evisceration of intestines on 10th day caused death in 2 patients in one and two days, respectively (wounds sutured).

III. ABSTRACT

HYPERFUNCTIONING ADENOMAS OF THE THYROID

Alex Blumstein

The so-called pure types of goiter may be divided into three groups: (1) diffuse colloid, (2) diffuse hypertrophic (or hyperplastic), and (3) adenomata. The admixture of these types in the same gland make a study of the anatomic and functional relationships very confusing.

In the Mayo Clinic series, one third of the cases of hyperthyroidism and from 17 to 20% of the cases of adenomatous goiter which were resected were diagnosed as hyperfunctioning adenomatous goiter. Boothby defines this condition as "a constitutional disease due to the presence in the thyroid gland of adenomatous tissue which, by maintaining an abnormally high and unregulated concentration of thyroxin in the body, causes an increased basal metabolic rate with the resulting secondary manifestations.

Plummer believes that these cases of adenomatous goiter associated with hyperthyroidism in which the gland shows adenomatous structure without hyperplasia of the surrounding parenchyma form a distinct group which can be clinically separated from ordinary exophthalmic goiter.

Incidence

About one-fourth of the adenomatous thyroids coming to operation at the Mayo

Clinic had symptoms of hyperthyroidism. Dr. Rice has studied the incidence of nodules in two groups of cases: (1) a postmortem series (individuals with no definite history of hyperthyroidism), and (2) an operative series (cases of hyperthyroidism). He found the incidence of nodules in the two groups to be practically the same, slightly over 50%. The incidence increased with age. In individuals between 70 and 75 years, the incidence was practically 100%.

Clinico-pathological relation

There are two main types of adenomas: the fetal and the adult; so-called because of their histologic resemblance respectively to normal fetal or adult thyroid tissue. These tumors are very apt to show degenerative changes of the hyaline, calcareous, hemorrhagic or cystic types. They may be small or large, single or multiple and, there may be an admixture of the fetal and adult types.

"In a varying percentage of cases, depending largely on the extent of the search, both intra- and extra-adenomatous areas of hypertrophy may be found that, in the individual appearance of the cells themselves, cannot be distinguished from the condition seen in exophthalmic goiter, except that there is not a general diffuse hypertrophy and hyperplasia throughout the entire gland."

MacCarty has pointed out "areas of hypertrophy" are more frequent in adenomatous goiters that are causing hyperthyroidism than in those that are not. The correlation is, however, not sufficiently constant to allow the pathologist to distinguish histologically with much accuracy between adenomatous tissue which is producing clinically the hyperthyroid symptoms from that which is not.

Physical findings and symptoms

Age: The condition is comparatively rare before 30 to 35 years of age. On the average, the patient is 48 years of age at the time of examination. Approximately one-half are over 50 years of age. The reverse is true in exophthalmic goiters in which disease the average is

37 years with 85% of the patients under 50 and 61% under 40 years of age.

Age of Patients Having Adenomatous Goiter Without Hyperthyroidism, Adenomatous Goiter with Hyperthyroidism and Exophthalmic Goiter.

<u>Decade</u>	<u>Number of Cases</u>	<u>Percentage of Patients by Decades Having Hyperthyroidism Caused by (1) Adenoma or (2) Exophthalmic Goiter.</u>		<u>Percentage of Cases in Each Decade of (1) Adenoma without Hyperthyroidism, (2) Adenoma with Hyperthyroidism, (3) Exophthalmic Goiter.</u>		
		<u>Adenoma, Toxic</u>	<u>Exophthalmic Goiter</u>	<u>Adenoma Nontoxic</u>	<u>Toxic</u>	<u>Exophthalmic Goiter</u>
From 0 to 9	1	0%	100%	0%	0%	1%
From 10 to 19	59	8	92	1.5	1	5
From 20 to 29	280	10	90	8	8	24
From 30 to 39	374	13	87	24	13	31
Below 40	714			33%	22%	61%
From 40 to 49	358	30%	70%	33%	29%	24%
From 50 to 59	253	46	54	27	32	13
From 60 to 69	75	77	23	6	16	2
From 70 to 79	2	100	0	0.5	1	0
Above 40	688			67%	78%	39%
Number of cases	1,402	366	1,036	254	366	1,036
Average age		48	37	44	48	37

(The Oxford Medicine, p. 905)

Duration of goiter

The average duration is 16 years before the onset of symptoms, while in exophthalmic goiters it is only 4 years.

Inspection and Palpation

There is an unsymmetrical enlargement of the thyroid gland. In less than 4% are thrills and bruit detectable and the thyroid vessels are rarely palpable. "There are no local distinguishing, physical characteristics to indicate the presence or absence of hyperthyroidism except that, in general, a single small, discrete adenoma is very apt to produce hyperthyroidism, while the very large, soft and cystic-feeling, colloid type of adenomatous masses usually do not do so.

Basal Metabolism Rate

The rate is as a rule lower in this condition than in the ordinary exophthalmic goiter.

Comparison of the Basal Metabolic Rate in 6,197 Patients with Thyroid Disorders and in 2,417 Patients with Conditions other than Thyroid.

<u>Diagnosis</u>	<u>Number of Cases</u>	<u>Above +20%</u>	<u>+20% to +16%</u>	<u>+20% to +11%</u>	<u>+15% to +11%</u>	<u>Normal +10% to -10%</u>
		%	%	%	%	%
Thyroid Diseases						
Exophthalmic goiter	2,569	93		5		2
Recurrent exophthalmic goiter	320	90	6		2	2
Adenoma with Hyperthyroidism	1,425	68		32		
Recurrent Adenoma with Hyperthyroidism	46	57	17		26	

(The Oxford Medicine, p. 885)

Heart

The changes in the heart depend on "the intensity and rapidity of progression of the hyperthyroidism, the age of the patient, the presence of an independent heart disease, the physical stresses and strains to which the patient is subjected and, finally the presence of pre-existing hypertension. Boothby calls attention to a group of cases in which the cardiac symptoms are far more obvious than the hyperthyroid symptoms so that the hyperthyroidism is sometimes overlooked.

Clinical Course

There is nervousness and mental instability, moderate tumor, loss in weight and in strength in spite of an increased appetite, palpitation, and excessive perspiration with tendency to moist, warm skin.

Differential Diagnosis

Since approximately one-third of the patients with exophthalmic goiter have adenomatous masses in the thyroid gland, palpitation alone cannot be relied upon for differential diagnosis. In hyperfunctioning adenomas, gastrointestinal crises, jaundice, exophthalmos, thrills and bruits over the superior thyroid vessels are characteristically absent. Dr. Rice feels that these patients do not have that "peculiar, high strung, vivacious nervousness and mental activity" seen in exophthalmic goiter. Boothby sums up the differential features in the following table.

1,656 Cases of Goiter Tabulated to Show Some of the Characteristic Features of Exophthalmic Goiter and Adenomatous Goiter with and without Hyperthyroidism.

	<u>Exophthalmic Goiter</u>				
	<u>Adenoma</u>		<u>Two Liga- tions, Rest and Thyroid- ectomy</u>	<u>One Ligation Thy- roidectomy</u>	
	<u>Non-toxic</u>	<u>Toxic</u>			<u>Thyroid- ectomy</u>
Number of cases studied	254	366	341	275	420
Age	44	48	37	38	36
Duration goiter, years	15.7	18.0	3.4	3.9	5.0
Age of onset of goiter	28	30	34	34	31
Duration symptoms, years		1.8	1.6	1.5	1.3
Age at onset of symptoms		46	35	37	35
Cardiac decompensation:					
Positive	13%	46%	54%	48%	24%
Probable	5	10	9	5	7
Exophthalmos	2	3	67	65	51
Thrills	4	5	63	58	39
Bruit	12	12	87	86	67
Weight, pathologic specimen, Gm.	187	152	59	55	51
Glycosuria	1%	2%	1%	1%	1%
Blood pressure:					
Systolic	141	158	150	146	141
Diastolic	85	86	75	74	77
Pulse pressure	56	72	75	72	64
Pulse rate	91	107	125	121	113
Basal Metabolic Rate	+2%	+30%	+65%	+53%	+33%
Clinical diagnosis correct	98%	88%	99%	98%	97%

(The Oxford Medicine, p. 911)

Use of Iodine

Plummer stated (1920) that among the known effects of iodine on goitrous thyroids are:

1. Prevention of diffuse colloid goiter in man.
2. Prevention of cretinism in offspring.
3. "The administration of iodine not infrequently starts adenomatous goiters to hyperfunction; once started, this may continue for years without further administration of iodine."

Means and Lerman, who feel that hyperfunctioning adenomas as distinguished from exophthalmic goiters is a doubtful clinical entity, state these cases respond to iodine as do those "with typi-

cal exophthalmic goiter." They feel that there is no convincing evidence of the production of thyrotoxicosis by means of iodine. In conclusion, they state:

"1. The clinical facts regarding iodine in thyrotoxicosis are that it produces an altogether characteristic and specific response, which consists in an amelioration of symptoms and a drop in metabolic rate. This response will occur at any stage of the disease.

2. It appears that the response has no relation to the duration or direction of progress of the disease but merely acts as a check on the intensity of its symptom.

3. These clinical facts are consistent with the theory that in thyrotoxicosis the thyroid allows the escape of thyroxine to proceed at an excessive rate; to leak, in fact, and that the cells of the thyroid hyperfunction in consequence. Iodine, it is suggested, sets up a temporary obstacle to this excessive outflow: it checks the leakage of thyroxine from the gland. The known facts of iodine and thyroxine content of the gland, blood and urine are consistent with such a theory.

4. We believe that so-called refractoriness is apparent, not real. Thyrotoxic patients who are unaffected by iodine are those who are already fully iodinated.

5. We doubt the existence of so-called iod-Basedow.

6. The iodine response is valuable in the management of toxic goiter, both in treatment and in diagnosis, but its fundamental nature must be familiar if it is to be used successfully."

IV. CASE REPORT

The following is a case in which there is difference of opinion as to the diagnosis of the type of hyperthyroidism. The clinician felt that it was a case of exophthalmic goiter. The surgeon operated under the diagnosis of "toxic adenoma."

A white female, 44 years of age, first became aware of a lump in her neck about 6 years previous to admission. She stated that there was no appreciable change in size. Two years before admission, she first experienced palpitation, shortness of breath, dizzy spells and "nervousness." During the latter period of these two years, she noted increasing weakness and swelling of the ankles. During the two year period, she lost 14 lbs. in weight.

Physical examination

Fine tremor of fingers, thyroid enlarged on left (3+), on right (1+); has a stare rather than an exophthalmos; blood pressure 134/76; bruit over the

goiter; heart enlarged to left, gallop rhythm.

Laboratory

Urine - negative. B.M.R. (2-23-35) +37%, (3-21-35) +24%, and (3-26-35) +9%. This drop in the basal metabolism followed the administration of Lugol's solution, drops XV q.i.d. E.K.G. showed marked myocardial damage, probably coronary disease. Orthodiagram showed diffuse enlargement of the heart. X-ray of chest - enlarged heart, atypical shape; slight displacement of trachea, suggesting an adenoma in the thyroid above the sternum.

Operation

3-29-35 - Enlarged right and left lobes of thyroid were found. The right seemed fairly normal, the left contained what appeared to be a large cyst.

Pathologic report

Gross: Left thyroid lobe - 50 grams. There is an adenoma which on cut section has a reddish, fleshy appearance. It is 5 cm. in diameter.

Micro: The adenoma shows irregular acini. There is a slight amount of infolding. The lining of the acini is formed by cuboidal and columnar cells. Some of the acini contain granular and stringy colloid material. Others show no colloid. Non-adenomatous area shows fairly regular acini which vary somewhat in size and contain a homogenous pink-staining colloid material.

Diag.: Adenomatous thyroid with areas of hyperplasia in the adenoma.

Gross: Right thyroid lobe - 12 grams. No adenomas.

Micro.: The acini are fairly regular. They contain a pink-staining homogenous colloid material and are lined by cuboidal or flat cells. Between the acini are fairly well formed lymph follicles with germinal centers.

Diag.: Thyroid tissue with lymph follicles.

V. CASE REPORT

EXOPHTHALMIC GOITER. PSYCHOSIS.

The case is that of a 31 year old, white female who in June 1934 became extremely nervous, experienced a weight loss of 25 lbs., palpitation of the heart and pain in the cords of the neck. She stated that her appetite increased markedly. She complained of excessive perspiration and intolerance to heat. During the latter part of 1934, she had frequent crying spells, was very sensitive and hyper-irritable. She talked more than usual and it was difficult for her to sit quietly. She had frequent attacks during which her heart pounded violently, and it seemed that her whole body would shake.

Physical examination

Extremely nervous, white female, moving and talking constantly and paying little attention to what is said. There is a definite lid-lag, inability to converge, fine tremor of the fingers and decided weakness of the quadriceps. The heart is extremely rapid but otherwise normal. There is a diffuse enlargement of the thyroid gland, no nodules are palpable. The diagnosis is marked thyrotoxicosis.

Course

Patient was treated with sedatives, fluids, high carbohydrate diet, and Lugol's solution. Her condition became worse, temperature rose to 104, pulse became more rapid, and agitation was so marked that restraints were necessary. She expired seven days after admission.

Autopsy

Revealed fatty metamorphosis of the liver, diffuse enlargement of the thyroid with marked hyperplasia. The follicles were lined by high columnar epithelium. The colloid was granular and stained poorly. There was infolding of the follicular lining and desquamation of epithelium. The thymus was enlarged (30 grams). Examination of the heart was negative.

Impressions

1. The complex histologic structure of goiters make a study of the anatomic

and functional relationships very confusing.

2. Plummer and others believe that cases of adenomatous goiter associated with hyperthyroidism in which the gland shows adenomatous structure without hyperplasia of the surrounding parenchyma form a distinct group which can be clinically separated from ordinary exophthalmic goiter.

3. The condition is comparatively rare before the age of 30 years; on the average, the patient is 48 years at the time of examination.

4. The average duration of goiter before onset of symptoms is 16 years.

5. The basal metabolism rate is as a rule lower than in exophthalmic goiter.

6. Gastro-intestinal crises, jaundice, exophthalmos, thrills and bruit over the superior thyroid vessels are characteristically absent.

7. The pathologist cannot histologically with much accuracy differentiate between adenomatous tissue which is producing hyperthyroid symptoms from that which is not.

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VI. MOVIES

Title: Spotted Wings

Released by: The Fox Motion Picture
Corporation.

VII. ANNUAL MEETING

Minnesota State Medical
Association, Minneapolis; June 24, 25,
and 26, 1935.

VIII. WANTED

Physician to take over
practice of V. A. Weed, M.D., Red Lake
Falls, Minnesota, from May 20 to June 10,
1935. See Dr. O'Brien for further de-
tails.