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THYROID METASTASIS TO THE SPINE.*

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The following case, which is unique in my experience, has to do with the question of thyroid metastasis.

F. R.; female; white; widow; age 56; a Russian Jewess and a tailoress by occupation, was admitted to the Nervous Wards of the Philadelphia Hospital, June 17th, 1904.

Family history: Father died of cause unknown. Mother died of old age. Had eight sisters all of whom are dead but none of whom suffered from any affection similar to her own.

Personal history: Had the ordinary diseases of childhood but subsequently was well until the onset of the present trouble. Gave birth to nine apparently healthy children. Suffered occasionally from rheumatism which she attributed to her working in a damp basement. For some years she had suffered from a goitre. This gradually became so large that she sought relief at the University Hospital about six years ago. Here she was operated upon by Dr. A. C. Wood, the thyroid being successfully removed and the patient making a good recovery. Dr. A. C. Wood kindly supplied me with a copy of the entry in the admission book at the University Hospital relating to her case. It reads as follows:

"F. R.; aged 50 years, born in Russia, tailoress; admitted Au-

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gust 15th, 1899. Diagnosis, goitre; removal by operation; recovery. Discharged September 4th, 1899."

Dr. Eugene Lindauer, who was associated with Dr. Wood in the operation and subsequent care of the case, writes me concerning her as follows:

"At the time of admission, she was unable to speak above a whisper and that gave her considerable labor. Her breathing was very dyspneic. The goitre was of the simple type, about equally enlarged in both lateral lobes. I recall that at macroscopic examination, it seemed in appearance like a normal thyroid; a great deal of yellow gelatinous material was seen to be lying in the follicles of the gland. The operation, which was under ether, passed off undisturbed and the union was primary. Her difficulty of speech and breathing, associated with the incomprehensible jargon and absence of relatives who knew anything concerning the growth, prevented a history from being taken. There were no nervous symptoms observable at any time of her stay at the University Hospital."

When admitted to the Philadelphia Hospital, the patient stated repeatedly that one year after the operation by Dr. Wood, pain, severe in character made its appearance in the left upper extremity, and that this was followed by a gradual and progressive wasting of the muscles. Later these pains became generally distributed throughout the body. They were sharp and shooting in character. About a year ago, the patient began to have very severe pains in the right hip. These pains extended into the right leg and were followed by a gradual contraction of this extremity. A few months later, a similar pain made its appearance in the left lower limb, and was likewise followed by a gradual and progressive contraction of this limb. Later still she also developed pain in the right upper extremity, together with a gradual and progressive wasting of the muscles.

Upon admission the following notes were made: The patient is a rather small, anemic, emaciated woman. Both legs are markedly contracted. The right thigh is flexed at right angles with the trunk; the right leg is flexed at right angles with the thigh; the foot is in a normal position, but the ankle joint permits of but little movement. Attempts to move the joints elicit pain. Very slight passive movements can be made at the right knee but with the expense of pain to the patient. Little or no move-

ment can be brought about at the hip. The left thigh is likewise much contracted, being completely flexed upon the body, the left leg being completely flexed upon the thigh, while the left ankle joint is in a condition similar to that of the right. Slight passive movements can be performed at the left hip and left knee joint but they give rise to pain. The right thigh is adducted and rests upon the left leg, just above the ankle. There are a number of ecchymoses on the left leg, over the lower part of the abdomen, over the left iliac spine and another on the right thigh, anteriorly just below Poupert's ligament. This latter area is tender to touch and swollen. There is a small gangrenous area on the right heel. The skin of the right leg is reddened where the right thigh presses upon it. Several areas of superficial ulceration are noted along the spinal column. An ecchymotic area is present to the left of the spinal column, three inches in diameter, just over the left floating ribs. Moving the patient in any manner causes marked evidences of pain. An examination of the spine reveals a marked kyphosis in the dorsal region.

Both upper extremities are markedly wasted. In the left arm, no movement of the wrist, fingers, elbow or shoulder can be performed. There is a partial ankylosis of the metacarpal phalangeal joints and the phalangeal joints. There is marked atrophy of the intrinsic muscles of the left hand and of all the muscles of the left forearm. The extensors and flexors are extremely atrophied. There is also atrophy of the triceps, biceps and of the deltoid. This atrophy, however, is not as marked as that observed in the forearm and hand. The sternal end of the clavicle appears to be displaced, and above the clavicle a scar is observed which the patient states is the result of the operation for the removal of the thyroid gland. The right arm has suffered less than the left arm, although its muscles are much atrophied and there is a similar though less marked fixation of the joints.

The tendon reactions of the left arm are much increased. There is also a marked increase in the myotatic irritability of the muscles of the left arm, especially in the biceps and triceps. There are no fibrillary tremors. The tendon reactions of the right forearm appear to be normal. Possibly there is a slight increase of myotatic irritability.

The knee jerks cannot at this examination be elicited. There is no ankle clonus but a marked Achilles' jerk is present upon the

right side. Upon the left side no reaction can be obtained, possibly due to fixation. The plantar reflexes are active on both sides. The great toe is slightly flexed on both sides. The right hip joint and right knee joint appear to be enlarged. The left hip and left knee joint do not appear to be enlarged. The skin is somewhat smooth and shiny over the left hand and over the right hip and right knee joint. There is no tenderness over any of the nerve trunks.

The muscles of the right arm respond well to the faradic current, as do also the muscles of the left arm. The intrinsic muscles of the left hand do not respond. There is no response likewise in the muscles of either lower extremity, nor of either gluteal region.

There is no paralysis of the cranial nerves. The pupils are equal. Tactile and pain sensations appear to be normal except that on the left thigh the patient calls hot, cold. The sphincters are normal. The patient is mentally clear and bright.

On October 24th of the same year, she was again carefully examined. As before it was noted that the patient is an emaciated pale woman, very senile in appearance. She lies upon the back, slightly inclined to the left, with both legs drawn up, the thighs flexed upon the pelvis and the legs on the thighs. The flexion is extreme on the left side and marked on the right. The right knee is crossed over the middle of the leg of the left side, while the left foot is drawn over the vulva. The vertebral column presents two prominences; one in the upper thoracic and another in the lower lumbar region. The left clavicle presents at its sternal end an enlargement, rounded in shape and semi-solid to touch. It is about the size of a guinea egg. The thorax does not present any deformity.

The lower extremities are in a state of contracture, and any attempt at extension provokes pain. No voluntary movements are possible. The knee jerks can be obtained with great difficulty. There is no ankle clonus on either side. A distinct Babinski is, at this examination, obtained upon the right side. The muscular atrophy is exceedingly marked in both lower extremities, more pronounced upon the left side. The gluteal regions are also markedly wasted.

In the arms the atrophy is extreme, especially in the small muscles of the hands. These changes are as before more marked

upon the left side than on the right. The fingers of the left hand are in a state of semi-extension and are fixed in position. The fingers of the right hand are still movable and the right hand can be closed. The muscles of the forearms, the arms and shoulder girdle are markedly wasted. The pectorales are also wasted. The trapezii have likewise suffered, though they are better preserved, as the patient can still shrug the shoulders fairly well. The patient can move herself slightly from side to side, but there is at no time any change in the position of the legs. The muscles of the face appear also to have suffered. Wasting is apparently present and more marked on the right side than on the left.

As regards sensation, it is noticed at this examination that there is an analgesia over the right lower extremity. Over the left lower extremity there is a hypalgesia with the exception of a few areas here and there. Over the trunk, anteriorly and posteriorly, that is over the thorax and abdomen and over the entire back, the pain sense is abolished. In the right lower extremity the temperature sense is likewise lost. This is also the case over the entire trunk, abdomen and thorax and back. In the upper extremities, the temperature sense is normal. It is also normal over the face.

Trophic changes are noted as follows: An ulceration on the inner side of the right heel, on the right big toe, on the prominences over the spine and over the external angle of the left eyebrow. On the right side the ilium is noted to be markedly thickened. The same condition is noted in the left trochanter. The knee joints are now both enlarged, the right more than the left.

Carefully made skiagraphs of the contracted knee joints failed to reveal any osseous change. However, a skiagraph of the left clavicle presented the shadow of a mass in which the sternal end of the clavicle, as well as the adjacent portion of the sternum were imbedded. This mass corresponded to the tumor already mentioned.

On November 7th, an eye examination was made by Dr. Shumway. The pupils were contracted 1.5 m.m. They responded promptly. The movements of the extra-ocular muscles were good. The eye grounds were entirely normal.

On November 21st, the patient suddenly developed a high temperature together with a very bad diarrhea. This diarrhea,

together with a variable temperature, persisted, and on November 23rd, marked increase of the rate of respiration and dulness over the right lung posteriorly made their appearance. The patient subsequently appeared to make a recovery from this condition. On the 8th of the following February, however, there was another sudden rise in temperature. Her face was at first flushed and subsequently became very pale. Her pulse was regular, full and bounding. No râles were heard upon the left side, but a few crepitant râles were discovered upon the right side. At the apex, a loud systolic murmur made its appearance, and at the aortic cartilage there was a systolic and also a diastolic murmur. The patient grew rapidly much weaker. On the following day signs of edema of the lungs made their appearance, the pulse became very weak and the patient died.

An autopsy was made by Dr. Allen J. Smith, Pathologist of the Hospital, at which the following notes were made:

Body of a white female, about 57 years of age; extremely emaciated; limbs so strongly drawn on the abdomen that it is impossible to state height; weighing between 75 and 85 pounds; hair gray, slight hairy development on upper lip; body and pubic hair scantily developed. Eyes gray, pupils unequal, right 4 m.m., left 3 m.m. in diameter; teeth of upper jaw mostly gone; post-mortem rigidity absent. Post-mortem lividity poorly marked; no edema; marks of bed-sores on left and right hips, excoriation on upper portion of right thigh on internal surface; old leg ulcer on inner surface of right tibia just above the malleolus; no other important marks. The left thigh is especially flexed on abdomen; the right a little less; legs are flexed upon the thighs; both thigh and knee joints are fixed; both arms and limbs show extreme emaciation. The left sternoclavicular joint produces beneath the skin a rounded eminence about 1.5 inches in diameter and 0.75 inches in height; consistency soft and gelatinous.

Preliminary Incision: Adipose tissue practically absent; abdominal and chest muscles extremely thin, but of normal color, rather soft in consistence; considerable bleeding from veins, dark fluid blood.

Abdomen: On inspection of the abdominal cavity, the exposed peritoneal surface is moist and glistening throughout; no peritoneal adhesions. Omentum is thin, greenish-yellow, marked with distended veins and extends well down over the intestines. Liver

in the nipple line extends to costal margin, body of the liver extends more to the left than usual; slight gastropotosis, reaching one-half inch below the umbilicus (lower border). Uterus slightly retro-flexed, partly distended with fluid. In the pelvic cavity, there are 25 or 50 c.c. of straw colored fluid.

Spleen: Weighs 150 g.; measures 11 x 8 x 2.5 cm.; roughly triangular in shape; non-adherent; capsule smooth, not thickened; of a light slate color; soft and flabby in consistence; cuts with slight resistance; cut surface dry and retracting a little; light red in color; trabeculae rather prominent; Malpighian bodies fairly visible; splenic artery somewhat stiffened and stands open. Adherent to the vessels at the hilum is a small calcareous nodule 2 m.m in diameter.

Stomach: Of normal size and shape; external surface normal throughout; walls uniform and thin throughout; internal surface smooth and towards the ends of the stomach there are a number of points of submucous hemorrhage and distended veins; no rugae; no ulcerations; mucus, thick and viscid covers the surface; contents are brownish, viscid substance with black "coffee ground" altered blood.

Small Intestine: Normal externally and internally save for a little injection of its vessels, with points of petechial hemorrhage in lower six or eight inches of ileum.

Large Intestine: Appendix is externally normal; 10 cm. in length; 5 mm. in thickness; is provided with full mesoappendix and runs upward behind the ileum; internally normal. Externally, the large gut is normal; is of a rather narrow lumen especially in the transverse gut (colon); wall is not unduly thick in any part, mucous membrane in the cecal region is the seat of petechial hemorrhage; also in the descending colon and sigmoid flexure the veins are congested, mucous membrane pigmented and caseous.

Liver: Weighs 1240 g.; measures 20 x 15 x 7 cm.; organ is non-adherent; capsule smooth and of normal thickness throughout; margins of gall bladder thinned out from pressure; organ is of a black purplish color, firmer than normal; cuts with slight increase of resistance; cut surface granular, dry; lobules distinctly outlined with dark red centres.

Gall bladder is of ordinary size; filled with thin, greenish fluid; cystic and common ducts open.

Pancreas: Weighs 90 g.; measures 23 cm. in length, slender;

externally normal; appearance of cut surface normal; cuts with resistance.

Mesenteric Glands: Slightly enlarged; fleshy in consistence; cut with resistance; internal surface red and fleshy.

Left Kidney: Weighs 170 g.; measures 12.5 x 5.5 x 3.5 cm.; organ is slightly enlarged; normal shape and consistency; light red in color; cuts with slight resistance; capsule removes easily, but tears the renal substance, leaving a smooth, light red surface without any superficial injection of vessels; cut surface uniformly light red in color; cortex measures from 6 to 8 mm. in thickness; towards the tips of the pyramids there is a small streaky uratic deposit. Pelvis and ureter normal.

Right Kidney: Weighs 170 g.; measures 12 x 5.5 x 3.5 cm.; externally and internally is like its fellow, save that the subcapsular surface is more granular; a few cysts. Pelvis and ureter normal.

Bladder: Is distended with clear urine; shows no abnormal appearance either externally or internally.

Uterus and Ovaries: Present no abnormal lesions; uterine wall thicker than usual and spongy; ovaries small, shrunken; no abnormal lesions.

Thorax: On opening, the thickening of the sternoclavicular joint above mentioned was removed and on section was light red in color and fleshy in consistence, on the deeper surface somewhat gelatinous; the head of the clavicle is widened or puffed out as if to accommodate the growth.

On opening the chest, a few old, firm adhesions are found laterally and at the apex on left side; on the right side firm adhesions laterally and posteriorly. In the upper two thirds, involving the third and fourth ribs, is a tumor growth, 10 cm. in length, with the rib 5.5 cm. in width and 3.5 cm. in thickness; the rib is involved in this growth and is destroyed by the growth; tumor is covered by the pleura within and externally by the remaining intercostal muscles; apparently encapsulated; on section is light red in color; translucent; surface is granular and contains grit and spicules. A similar tumor involves the eighth and ninth ribs on the same side (right). On the left side smaller ones were present on the first, fourth and sixth ribs. On the right side of the vertebral column there is a small growth of the same kind, extending from the eighth and ninth vertebræ.

Left Lung: Weighs 300 g.; light gray in color; pleura smooth

save where adhesions existed; external pigment in perilobular positions; substance is crepitant throughout; at the apex is a firm nodular growth; posterior portion is slightly boggy; cut surface is light reddish-gray in dependent parts; fairly dry, but in dependent parts exuding a moderate amount of frothy fluid; at the apex there is one small encapsulated, slightly calcified nodule, but no other tubercular nodules.

Bronchial Glands: Are enlarged, black in color, firmer than normal in consistency; no calcification or tuberculous nodules.

Right Lung: Weighs 750 g.; surface where adherent, is roughened, organ dark reddish gray in color; lower lobe non-crepitant, fleshy upper lobe faintly crepitant; middle lobe moderately crepitant, but boggy. Lung cuts with fleshy resistance; cut surface is dark red in color; in upper and middle lobes exuding slightly bloody and frothy fluid; almost airless blood from the lower lobe, congested passively.

Cross section on bronchial tubes exude pus, especially in lower lobe; no trace of tuberculous change of any type. Bronchial walls rigid; mucous membrane deeply red; longitudinal bands prominent.

Heart: Weighs 280 g.; of normal shape; epicardium smooth throughout, with slight fatty deposit in the usual positions; wall of left ventricle 18 mm. in thickest part; right ventricle 6 mm.; muscular substance dark red, firm; endocardium of cavities normal throughout; aortic opening 25 mm. in diameter; pulmonary 26 mm.; mitral 30 mm.; tricuspid 35 mm. in diameter; leaflets of the right heart are normal; aortic leaflets practically normal; coronary vessels normal; all the cavities contain a small amount of stratified clot.

Aorta: Small atheromatous patch in the arch of the aorta, otherwise the ascending and descending aorta are free.

In the neck, attached to the trachea were several small tumors like those met with in the thorax.

Head: Scalp removed easily; of normal thickness and appearance; non-adherent over the tumor to be mentioned. Beneath the dura. penetrating the external table of the skull is a small, light red tumor of the same type as noted on ribs, between 1 and 2 cm. in width.

Skull is of normal thickness; diploic substance well marked; dura is non-adherent save to a slight degree about the longi-

tudinal suture; veins of pia moderately congested; basilar vessels normal.

Brain: Weighs 1245 g.; normal in appearance.

On cleaning the tissue along the spinous process for removal of the cord, two tumors like those already mentioned were found; the larger at the upper edge of the sacrum, the smaller involving the spinous process of the second lumbar vertebra.

Spinal Cord: On opening the canal and removing the cord, a tumor was found involving the fourth and fifth cervical vertebrae, pressing upon the cord and involving the dura mater; involving the second lumbar vertebra there was a smaller tumor without adhesions to the dura.

The cord and spinal tumor were submitted to microscopical examination.

The tumor, as above stated, involved the dura mater and pressed upon the cord; somewhat more upon the left side of the cord than upon the right. It extended from the lower third of the cervical enlargement downward a distance of about 7 cm. It was a hard mass, but gelatinous in consistency in its middle portion. It was somewhat wider in its middle portion than at its upper and lower parts. The bulk of the tumor was located more on the left side than on the right side of the cord. It was external to the dura, to which it was extremely adherent. The cord at the level of the tumor was much deformed and flattened.

The microscopical examination revealed the astonishing fact that the tumor was made up of thyroid tissue. All of the sections revealed the aveoli of the thyroid gland, some of them large and some of them medium sized; others very small. All of them revealed the typical structure of these aveoli lined by a single row of cubical epithelium and all were filled with the characteristic colloid material. The dura was much thickened and tracts of fibrous tissue can be seen leaving the dura and spreading among the acini.

The spinal cord revealed the following changes:

The section of the cervical cord immediately above the tumor revealed marked areas of degeneration involving almost the entire portion of Goll's columns, also to some extent adjacent portions of the columns of Burdach. The peripheral areas of the cord have also suffered considerably, especially is this true upon the left side. Here the direct cerebellar tract and Gowers'

column have undergone marked degeneration. Upon the right side peripheral degeneration is present though less marked than upon the left side, involving here only the direct cerebellar tract; Gowers' column appears to be but slightly involved, if it has not wholly escaped. Sections of higher levels of the cord again reveal extensive degeneration in the columns of Goll and also degenerative changes in the columns of Burdach, more especially upon the left side. Marked peripheral degeneration, that is of the direct cerebellar tract and Gowers' column are observed upon the left side. Upon the right side faint degeneration of the cerebellar tract is observed.

Sections taken from the level of the tumor reveal a marked deformity of the cord caused by compression of the left half of the cord in its posterior portion. This depression is most marked in the region of the posterior cornu. The entire left half of the cord is smaller than its fellow. The depression has evidently been caused by the tumor. Areas of degeneration are present in Burdach's columns. The fibres of Goll's columns appear to be unaltered. Very decided degeneration is present in both crossed pyramidal tracts. Similar degenerative change is noted in the left direct cerebellar tract and especially in the left Gowers' column. The direct pyramidal tracts also reveal degenerative change. Some of the posterior roots on the atrophied side are degenerated. The dura is also decidedly thickened; especially upon the atrophied side it is the seat of a marked round-celled infiltration. The pia arachnoid of the same side is also considerably thickened. Bundles of nerve roots are also seen surrounded with connective tissue. The blood vessels seem enlarged and the walls are the seat of nuclear infiltration.

Sections of the cord in the lumbar region reveal degenerative changes of both the pyramidal tracts and also some degeneration in the columns of Goll. The changes in the columns of Goll are evidently those of a descending degeneration as they are found entirely below the level of the lesion.

The microscopical findings are in accord with the motor and sensory changes noted during life. The contractures and atrophies are to be referred to the involvement of motor roots and to the extensive changes in the pyramidal tracts. The dissociated loss of sensation is exceedingly interesting and is no doubt to be referred to the involvement of Gowers' columns. This is

rendered the more probable by the fact that this loss was especially pronounced in the right leg, while it was the left Gowers' tract in which the most extensive destruction had occurred.

The above case opens up two questions: first, as to the possible metastasis of benign tumors, and secondly whether a thyroid tumor to become metastatic, must not necessarily be malignant. From observations made in recent years, it is evident that an ordinary goitre which has existed for a long time and which has never given rise to any symptoms suggesting malignancy may suddenly become widely diffused. By preference this metastasis takes place in the bones and in the lungs. In some patients secondary tumors of thyroid structure have been removed without any attention having been attracted clinically to the thyroid gland itself. Cohnheim, Lucke and Muller have described such cases. They were collected by Honsell¹, in 1899, in a paper on benign tumors giving rise to metastasis. Later Patel² observed in the service of Jaboulay, a remarkable case. The histological examination was made by Gayet and revealed unexpectedly a tumor of thyroid structure in a patient in whom a goitre existed but apparently was intact.

Patel has collected eighteen cases of thyroid metastases. The metastases were found especially in the bones, particularly the short and flat bones; for instance in the cranium, in the lower jaw, in the vertebral column, in the pelvis and lastly in the long bones. In the spinal column, the lesions begin, it would appear, in the spongy substance of the vertebra and subsequently spread into the arches; affecting the periosteum, the nerve roots and lastly the contents of the spinal canal. The process may go on to marked destruction of the vertebral bodies.

In the case here reported, thyroid metastases evidently occurred in various situations although that occurring in the spinal column was undoubtedly the cause of the nervous symptoms presented by the patient, if not the direct cause of her death.

Among the eighteen cases collected by Patel, there were four in which the spine had been either alone or especially in-

¹ Honsell. *Beitrag z. klin. Chirug.*, XXIV, i.—*Semaine Médicale*, 1899, "Goîtres bénins formant des métastases."

² Patel. "Tumeurs bénignes du corps thyroïde donnant des métastases," *Revue de Chirurgie*, 29, 1904, page 398.

volved. Two of these in a measure resemble the case here reported.

The first is a case reported by Gusenbauer³ in 1891. The patient was a woman who after suffering from violent generalized pains became paraplegic and presented a kypho-scoliosis of the lower thoracic vertebræ. An elastic non-fluctuating tumor was present upon the right side of the tenth and eleventh thoracic vertebræ. Simultaneously a large but benign goitre was present. The spinal tumor was extirpated and revealed upon microscopical examination, the typical structure of the thyroid gland.

The second case is that reported by Hollis⁴ in 1903. There was likewise present a paraplegia caused by multiple meningo-spinal neoplasms, having the thyroid gland structure. The patient was a man who first suffered from attacks of lumbago of variable intensity. Four or five of these attacks were very violent. He also suffered from severe headache and vomiting. He was admitted to the Sussex County Hospital on the 12th of December, 1901, and about one week later suffered from a paralysis of the left inferior extremity and subsequently of the right inferior extremity. A total paralysis rapidly supervened both motor and sensory; girdle pains also were present. Incontinence became established, a large bed-sore made its appearance upon the sacrum and the knee-jerks were abolished. The temperature was normal. Later it was normal and even subnormal. The patient remained in this condition for a month. His bladder was washed out and his headaches were treated with phenacetin. The vertebral column, repeatedly examined, failed to reveal any sensitive point. The girdle pains persisted. Later a deep pain made its appearance between the shoulders, together with a marked dyspnea. Some months later, there was edema of the left leg. Finally a tumor made its appearance deeply situated back of the left clavicle and the sterno-mastoid muscle. This tumor increased in size and a hard indented mass could be felt back of the anterior border of the muscle. Subsequently the tumor diminished and only two small glandular masses could be detected. A contracture of the back of the neck and of the right arm established itself. The patient finally died almost asphyxiated on the 11th of April.

³ Cited by Patel.

⁴ Hollis. *The Lancet*, March 28, 1903, p. 884.

At the autopsy, a tumor was found involving the membranes of the brain posteriorly and to the left of the falx. The brain substance of the external perpendicular fissure was involved. On the left of the cerebellum, a similar tumor was found. On the anterior surface of the body of the third dorsal vertebra, there was found a tumor which invaded and contracted the spinal canal. The spinal cord was entirely degenerated at this level. The thyroid gland in this case was not augmented in volume. There was nothing abnormal in the thorax. Two little tumors were found in the liver. The two suprarenal capsules were hypertrophied.

The microscopical examination of the tumors in the cerebellum, falx and suprarenal capsules revealed an identical structure; that is, numerous spaces and cystic cavities lined with epithelium and filled with colloid material. The structure was essentially a thyroid structure and the case is especially remarkable for the fact that there was at no time any increase in volume of the thyroid gland itself and for the further fact that nothing in the patient's symptoms had attracted any attention to the thyroid gland during life.

The question as to the malignant character of the enlargement of the thyroid gland in cases of metastasis, is one that cannot be regarded as settled. However, it is very suggestive that among the eighteen cases collected by Patel, thirteen were regarded as benign by the authors reporting them. In the remaining five, the benign or malignant tumor of the thyroid enlargement is not mentioned. In the present state of our knowledge, the problem can only be answered in a speculative way. It appears that simple hypertrophy plays no rôle in the etiology of thyroid metastasis. Patel calls attention to the interesting fact that it is particularly the colloid goitres in which metastasis occurs. They especially present diffuse cellular proliferation and it is readily comprehensible how under such circumstances metastasis could occur. Further goitres that are decidedly cystic present also vegetations in their interior and these may break down. That fragments should thus find their way into veins and capillaries, does not seem strange. Still it is remarkable, inasmuch as colloid goitres are relatively common, that thyroid metastasis does not occur more frequently. Wolfer maintains that if a metastatic growth not only increases in size, but

also takes on a destructive action upon the bone, the primary tumors cannot be considered as benign, not even when clinical, anatomical or even histological investigations have failed to establish their malignant character. Metastasis having once established itself, it can readily be understood how the occurrence of the new growth may at times be benign and at times malignant. Indeed it is not inconceivable that in cases in which there is a multiple metastasis, that some of the new formations may vary as regards this quality. Some may present benign and other malignant characteristics. As Patel points out, if the metastasis be benign, we will observe the typical structure of the thyroid gland. The vesicles will present some regularity as regards volume and arrangement. They will contain colloid material and will be lined by regular cubical epithelium with well-defined nuclei. If, on the other hand, the metastatic formation be malignant, we will probably find side by side with normal thyroid vesicles, areas in which are found irregularly shaped cavities crowded with epithelial cells of the same type as those which line the vesicles, but irregularly arranged, heaped in rows of disordered accumulations. This very absence of regularity would suggest malignancy. In the tumor of the case here presented, the alveoli are singularly normal in their appearance and malignancy appears to be absent. Whether this was the case in the other metastatic tumors observed in the general autopsy, was unfortunately not determined as only the spinal tumor was preserved. That pure and absolutely benign metastatic growths are possible, is extremely probable. Further, it follows that such metastatic growths exert, in the economy, a function similar or identical with that of thyroid tissue in its normal position.