

# Pseudo-goiter

## *The Modigliani syndrome*

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The long and graceful female neck is not ordinarily a problem in differential diagnosis. When there is associated lordosis of the cervical spine, the reversed "C" or swan-like configuration can make the normal anterior neck structures so prominent as to be confused with thyroid enlargement. A simple physical examination should resolve any questions, but the fact that we have had four such young persons referred for "goiter" prompts this report.

**Case 1.** A girl, 10 years and 6 months of age, was examined at the Cleveland Clinic in 1972 with a chief complaint of an "enlarged thyroid." Her thyroid gland had been thought to be enlarged for the past 3 years. The possibility of a thyroid neoplasm had been considered and surgical exploration had been suggested. Previous studies included a T<sub>3</sub> value of 28% in 1969, 30% in 1970, and 28% in 1971; protein bound iodine was 4.7  $\mu\text{g}/100\text{ ml}$  in 1969 and 4.9  $\mu\text{g}/100\text{ ml}$  in 1970. Several roentgenograms and an esophagogram had been performed and were said to have been normal. Otherwise her history was that of a normally active person. There were no complaints and her school work was superior.

Results of general physical examination were normal except for a prominence of anterior neck struc-



**Fig. 1.** Roentgenogram of Case 1 demonstrating normal cervical spine lordosis.

tures. This prominence disappeared when she was instructed to hold her neck straight. There was no sign of hyperthyroidism or hypothyroidism. Additional laboratory tests were not thought to be necessary. A roentgenogram of the neck was obtained to document the cervical lordosis (*Fig. 1*), and the situation was explained to the patient, the parents, and the physician. There has been no further problem.

**Case 2.** A girl, 8 years and 4 months of age, was examined at the Cleveland Clinic in 1972 with a chief complaint of a "goiter". The prominence of the anterior structures of her neck had been noted only 2 weeks prior to her visit here. She was said to be tired, irritable, and hungry. The results of PBI and T3 tests obtained by

her referring physician were said to have been normal.

On examination she was of average height and weight. There was no sign of hyperthyroidism or hypothyroidism. Her entire physical examination showed no abnormalities except for a prominence of her anterior neck structures (*Fig. 2*). These became much less prominent when her normally lordotic neck was straightened. Results of laboratory studies were normal including a T4 by column of 1.05  $\mu\text{g}/100$  ml, PBI 7.3  $\mu\text{g}/100$  ml, and cholesterol value of 120 mg/100 ml. The radioactive iodine  $^{131}\text{I}$  uptake was 24% at 24 hours. Roentgenograms demonstrated the cervical spine lordosis (*Fig. 3*). She was considered to have no disease, and the normal anatomic variation due to the cervical



Fig. 2. Case 2. Prominent normal anterior neck structures.

lordosis was explained to all concerned. There has been no further complaint.

**Case 3.** A boy, 15 years and 5 months of age, was examined at the Cleveland Clinic in 1973 with a chief complaint of "something wrong with my neck." He had been a patient here previously with a torsion appendix of the right testicle and some minor problems related to sports injuries. On this occasion his parents had become concerned about the prominence of his anterior neck structures, and they sought consultation in the Department of Pediatrics and Adolescent Medicine.

Results of physical examination were normal except for the prominence of the anterior neck region (Fig. 4). Roentgenograms demonstrated the cervical lordosis (Fig. 5). Results of all laboratory studies

were normal including a T3 of 29.7%, a PBI of 5.9  $\mu\text{g}/100$  ml, and a cholesterol value of 185 mg/100 ml. The normalcy of his prominent anterior neck structures was explained to the parents.

**Case 4.** A girl, 8 years and 6 months of age, was examined at the Cleveland Clinic in 1957. This patient's problem was more complicated than that of the preceding three cases. She was also the first patient who caused us to consider the role played by cervical spine lordosis in apparent thyroid enlargement.

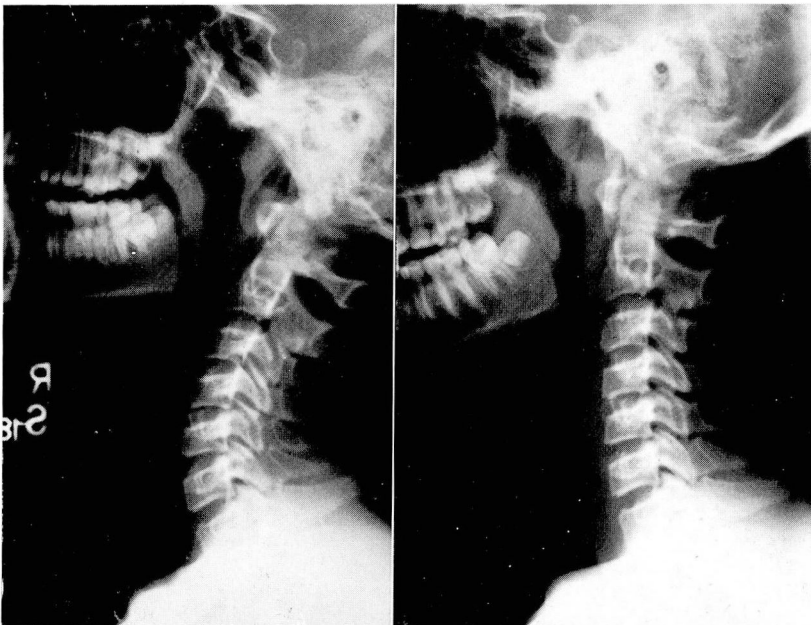
This child's mother had been concerned "because her throat always seemed so full." Other complaints included irritability, nervousness, poor appetite, restlessness, sleeplessness, fatigue, leg aches, abdominal pain, and constipation. These



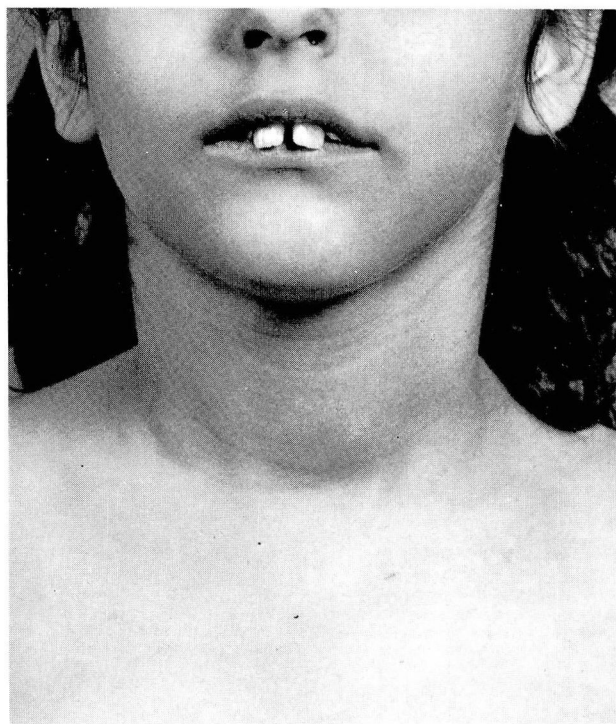
**Fig. 3. A,** Case 2. Normal cervical lordosis. **B,** Correction of lordosis when patient was instructed to straighten her neck.



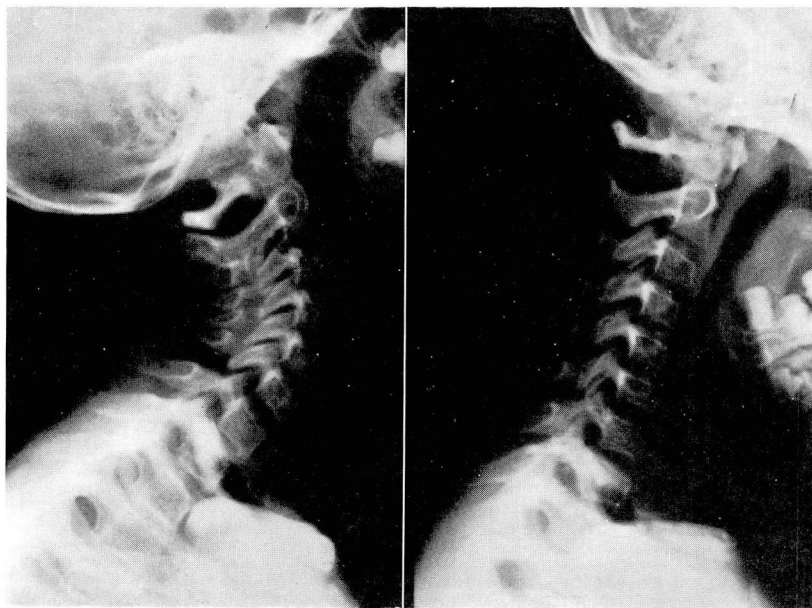
**Fig. 4.** Case 3. Prominent normal anterior neck structures.



**Fig. 5.** Case 3. Normal cervical lordosis and voluntary straightening of cervical spine.



**Fig. 6.** Case 4. Iodine induced goiter.



**Fig. 7.** Case 4. Normal cervical lordosis and voluntary straightening of cervical spine.

symptoms plus the prominence of the anterior neck structures led her physician to prescribe Lugol's solution, 10 drops two or three times a day. There was no record of laboratory studies obtained by her physician. Lugol's solution (Strong Iodine Solution, U.S.P.) had been used regularly for 6 months when the increasing size of her "goiter" led to referral here.

On examination she was a thin and nervous child. Her height was 120 cm (<10%) and her weight 40 kg (<3%). Her eyes were prominent but she was not considered to be exophthalmic. The thyroid gland was two or three times normal in size (Fig. 6). There was no bruit and the gland was slightly lobular and rubbery. Otherwise, results of the physical examination were normal. There was no clear evidence of hyperthyroidism or hypo-

thyroidism. The basal metabolism rate was -11. The plasma cholesterol level was 200 mg/100 ml, the PBI was 11  $\mu$ g/100 ml.

There was significant lordosis of the cervical spine (Fig. 7). It was noted that the goiter was apparently much smaller when the neck was held erect.

We assumed that her problem was due to an iodine induced goiter plus possible struma lymphomatosa. A biopsy was considered but not done. The iodine solution was discontinued and the child was given desiccated thyroid U.S.P., 60 mg per day. At the end of 1 year the glandular enlargement was no longer present; the many emotional symptoms were still present. The patient was instructed to discontinue thyroid medication.

She was then lost to follow-up on our service. However, in 1970, at age 22, she



Fig. 8. The normal graceful neck with prominent anterior structures.



Fig. 9. Modigliani: portrait of Lunia Czechowska, 1919.

was examined here in the Department of Plastic Surgery for a rhinoplasty. She was still taking thyroid, 20 mg per day. No goiter was present and she was thought to be euthyroid. No laboratory work referable to the thyroid was obtained.

In retrospect, we believe that the lordosis of her cervical spine led to an original erroneous diagnosis of thyroid disease and treatment with iodine which then induced a goiter.

### Discussion

The graceful neck has often been portrayed in art. The famous bust of Queen Nefertiti is a good example. African art commonly demonstrates the elongated neck, sometimes exaggerated by multiple metal necklets.

Such a neck is commonly seen in beautiful women of the American Black population (*Fig. 8*).

A neck, long and curved to an exaggerated degree is a distinguishing feature of the art of Amedeo Modigliani (*Fig. 9*). Modigliani was influenced in the development of his distinctive style by his admiration of African sculpture.<sup>1</sup> Since the long graceful neck is the hallmark of the painting of Modigliani, it would seem appropriate to refer to pseudo-goiter associated with cervical lordosis as the Modigliani Syndrome.

### Reference

1. The Library of Great Painters: Modigliani. New York, Harry N. Abrams, Inc., 1966.