Two cases of primary thyroid disease and hip fracture

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INTRODUCTION

Although the exact mechanism is not fully understood, some skeletal abnormalities are reported in patients with primary thyroid disease (McLean and Podell, 1995; Rosen, 1997). Prompt and adequate medication may improve the prognosis. This article describes the clinical course of two patients with primary thyroid disease and reviews thyroid hormone-related skeletal problems.

DISCUSSION

Thyroid dysfunction is the most common endocrine disease. In the patients reported in this article, accidental fractures led the authors to suspect thyroid problems. Skeletal development is complex, controlled by genetic, nutritional and hormonal factors. Since thyroid hormone is shown to potentiate the effect of growth hormone on skeletal growth, and insulin-like growth factor-1 levels are decreased in hypothyroidism by an unknown mechanism, impaired skeletal development may occur in hypothyroid patients, especially juvenile patients.

Generally, thyroid hormone replacement therapy has minimal or no effect on bone mineral content (Krolner et al, 1983), and treatment with levothyroxine does not increase the risk of hip fracture in adult patients with reduced thyroid function (Wejda et al, 1995). The hypothyroid patient (case 1) highlights that adequate hormone therapy is effective not only for improving thyroid function, but for treating associ-

CASE REPORT 1

A 13-year-old girl had right coxalgia after falling down during exercise and was diagnosed as having a fracture with slipped capital femoral epiphysis. Fixation surgery of the head of the femur was performed at an orthopaedic hospital (*Figure 1*). As hypothyroidism was strongly suspected because of her elevated serum total cholesterol concentration (391 mg/dl; normal range 150–219 mg/dl), she was transferred to the authors' hospital. She did not have mental retardation nor delayed growth, but was in menarche. Laboratory data were as follows: free triiodothyronine (T_3) 0.9 pg/ml (normal range: 2.47–4.34 pg/ml), free thyroxine (T_4) 0.10 mg/dl (normal range: 0.97–1.79 mg/dl), thyroid-stimulating hormone (TSH) 770 μU/ml (normal range: 0.34–3.5 μU/ml), thyroid peroxidase (TPO) antibody 7 U/ml (normal range: <0.3 U/ml). Enhanced cervical computed tomography showed an atrophic thyroid gland. A specimen taken from her thyroid tissue was too small for microscopic examination. She was diagnosed as having chronic thyroiditis, probably Hashimoto's disease, and triiodothyronine was started at a dose of 5 μg/day. Two years later, she is euthyroid (taking triiodothyronine 37.5 μg/day), has normal menstruation and has not required any additional fixation surgery.

CASE REPORT 2

A 56-year-old woman, previously deemed to be healthy, had an osteoporotic fracture of the left femur during walking (*Figure 2*). She received fixation surgery of the head of the femur at an orthopaedic hospital. Since other disease was suspected because of her low bone mineral density (40% lower than that of women of a similar age), she was transferred to the authors' hospital. Thyroid function was as follows: free T_3 7.9 pg/ml, free T_4 4.21 mg/dl, TSH <0.05 μU/ml, TPO antibody 14.6 U/ml, 1,25-dihydroxy vitamin D_3 7.4 pg/ml (normal range: 20–60 pg/ml). A scintigram showed a hypertrophic thyroid gland with increased uptake of iodine-123. She had had no problem with menstruation, and her menopause had occured at 52 years of age. Thiamazole (15 mg/day) was started as she was diagnosed as having Basedow's disease. About 2 years later, she was euthyroid, taking the same dose of the drug. Her bone mineral density had improved to 95% of that of an age-matched woman. Additional fixation surgery was not performed.

Figure 1. Hip X-ray of patient with hypothyroidism (case 1).

Figure 2. Hip X-ray of patient with hyperthyroidism (case 2).

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ated skeletal problems in young patients with hypothyroidism.

Hyperthyroidism can adversely affect bone and increase the risk of hip fracture (Greenspan and Greenspan, 1999). Thyroid hormone acts directly on bone to increase its resorption and reduce 1,25-dihydroxy vitamin D_3, as shown in the hyperthyroid patient (case 2). Antithyroid treatment for excess thyroid hormones increases bone mineral content in patients with elevated thyroid function. Adequate antithyroid therapy is also effective in treating actual skeletal abnormalities.

CONCLUSION

This article has reported two successfully treated cases of thyroid disease with fracture of the femur. If skeletal problems are detected, the possibility of concomitant thyroid diseases should be considered. Adequate therapy for such problems will improve skeletal abnormalities, probably by normalizing bone metabolism. HM

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IN THE PUBLIC'S VIEW...

Paying the price of civilization

Woman's Hour on Radio 4 is not my habitual listening. But I was driving down the M5 at 10 o'clock on a murky morning. The preview promised an interview with a woman taking some sort of legal action to get her medical notes altered. Having exercised her legal right to see her notes, she disagreed with what was written in them.

Like much of what is happening in the world, patients having the right to see their notes and getting copies of all letters written about them is an excellent idea – for most patients. Then there are the awkward few. To an anaesthetist (who avoids pain clinics), this sort of problem is exceedingly rare, but what do you write to a GP about a patient they have referred to you who is a time-waster inventing symptoms to get attention?

There used to be a technician in our region who put down on his job application forms that one of his hobbies was taking organizations to industrial tribunals on the grounds of racial discrimination. And he did: the count was above 50. Attempts to make things fairer inevitably cost time and money, mean lots of forms have to be filled in, do indeed make things fairer for the reasonable, but allow the unreasonable to cause almost more trouble than the original injustice. It is a price we pay for civilization.

In the end, I arrived at my destination enlightened about refuges for women suffering violence, and about another topic that I've since forgotten, but before the woman could tell me about her medical notes. However, I don't think it's right. What's written must remain written, even if the woman is allowed to add her opinion.

Much has been made of the ruling that transsexuals, on the basis of the European Human Rights Act, can change their birth certificates. This is Orwellian. You can change your gender – which is sociologically determined – but you cannot change your sex – which is biologically determined. Once you've got a Y chromosome, or your X chromosome has a twin, you're stuck with it.

It's all tied up with the 'right to have a family life', and transsexuals cannot, at the moment, marry. The government doesn't want same-sex marriages, so the transsexuals' only option is to try to change their sex. But it doesn't matter what the lawyers decide about rights, this is changing the unchangeable. It can't be done. If it is done, it is a fiction. Letter-writers to the *Guardian* wrote about wanting to change their parents or their birthdays.

We depend on lawyers and their complex and lengthy reasonings (it's another price we pay for civilization). But they don't always get it right: the law is indeed sometimes an ass. While we are still in the dark about the magnitude of risk from variant Creutzfeldt–Jakob disease, the legal ruling about blood transfusions is that the public have the right to expect that there is no risk from blood. This puts the Blood Transfusion Service in an impossible position. There isn't a single risk-free medical treatment, and their lordships need to think again. They also need to think sensibly about leopards and spots. HM

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