
RSNA Press Release

New CT Technology Shows Anorexia Impairs Adolescent Bone Development

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OAK BROOK, Ill. — Children and teenagers with even mild cases of anorexia exhibit abnormal bone structure, according to a new study appearing in the December issue of *Radiology* and presented at the annual meeting of the Radiological Society of North America (RSNA).

"Adolescence is the most critical period for growth of bone mass, and the onset of anorexia interferes with that process," said Miriam A. Bredella, M.D., musculoskeletal radiologist at Massachusetts General Hospital and assistant professor of radiology at Harvard Medical School in Boston. "Impairment of bone development may permanently alter bone structure and increase the risk of fractures and osteoporosis in adult life."

Anorexia is an eating disorder characterized by emaciation, distorted body image and intense fear of gaining weight. People with the disorder are obsessed with weight control and often perceive themselves as overweight, even when they are dangerously thin. The disorder primarily occurs among young women and affects one in 100 adolescent girls, according to the National Women's Health Information Center.

Among the many health problems associated with anorexia is bone loss. Typically, dual energy x-ray absorptiometry (DXA) is used to test bone mineral density in adolescents with anorexia.

Dr. Bredella and colleagues set out to determine if alterations in bone structure occur before significant decreases in bone mineral density become evident.

The researchers used high-resolution, flat-panel volume computed tomography (CT) and DXA to study 10 adolescent girls, age 13 to 18, with mild anorexia and 10 age-matched girls

At A Glance

- High-resolution, flat panel volume computed tomography (CT) depicts changes in bone structure in adolescents with anorexia.
- Adolescence is a critical period for growth of bone mass. Impairment of bone development may increase risk of fracture and osteoporosis later in life.
- Changes in bone structure may occur well before decreases in bone mineral density become evident.

without the disorder. The new, high-resolution CT exam allowed the researchers to identify differences in bone structure between the patients with anorexia and the healthy controls, whereas bone mineral density measurements obtained using DXA did not.

The results showed that while there was not a significant difference in bone mineral density between the anorexic patients and the healthy control group, there were significant structural differences, indicating that changes in bone structure begin to occur in anorexic patients well before decreases in bone density.

"Our data suggest that reassuring values of bone mineral density obtained using DXA may not reflect the true status of bone structure in this undernourished population," Dr. Bredella said. "In patients with anorexia, bone structure should be analyzed to detect abnormal bone health. Flat-panel volume CT allows the examination of bone at high resolution with relatively low radiation exposure making it a suitable technique for evaluation of bone structure in adolescent patients."

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"Distal Radius in Adolescent Girls with Anorexia Nervosa: Trabecular Structure Analysis with Very High Resolution Flat-Panel Volume CT." Collaborating with Dr. Bredella on this paper were Madhusmita Misra, M.D., Karen K. Miller, M.D., Ijad Madisch, M.D., Ammar Sarwar, M.D., Arnold Cheung, M.D., Anne Klibanski, M.D., and Rajiv Gupta, M.D., Ph.D. Journal attribution requested.

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