

# 'Self-Embedding' of Foreign Objects Reported

BY SUSAN BIRK  
Contributing Writer

CHICAGO — Radiologists have reported cases of self-mutilation by adolescents involving the deliberate embedding of foreign objects such as paper clips, staples, and pieces of glass into soft tissues of the arms, hands, feet, and ankles.

The behavior, which exceeds in severity the more well-documented patterns of adolescent self-injury such as cutting, burning, and bruising, may represent "a new, discrete entity," said Dr. William Shiels II, chief of radiology at Nationwide Children's Hospital, Columbus, Ohio.

Dr. Shiels presented the results of a study of 10 patients at the annual meeting of the Radiological Society of North America. He said the behavior has not been reported as a problem in adolescents in any of the world literature to date.

Researchers noticed the pattern of self-injury during the course of an ongoing longitudinal study of a novel percutaneous, image-guided, minimally invasive technique to remove soft tissue foreign bodies (STFBs) in pediatric patients.

Data on 505 patients have shown the technique's safety and effectiveness in removing STFBs with minimal scarring. In most patients treated with the procedure, the injuries were accidental (stepping on a piece of glass, for example); however, in 10 patients, the injuries clearly were self-inflicted. One patient had inserted unfolded paper clips measuring 16 cm in length bilaterally into her biceps muscles.

Of these patients, 90% demonstrated suicidal ideation or behavior, and all had



This x-ray shows eight metal pieces a teenage girl embedded in her arm.

multiple psychiatric comorbidities, such as bipolar disorder, borderline personality disorder, depression, posttraumatic stress disorder, attention-deficit/hyperactivity disorder, and obsessive compulsive disorder.

All of the teens had histories of psychological, physical, and/or sexual abuse and were living in foster homes or group homes. They crossed all socioeconomic strata and racial groups; 90% of the patients were girls. Most (70%) embedded objects more than once, and of these, 71% had an escalating pattern of self-injury with increasingly large, painful objects.

Dr. John Campo, chief of child and adolescent psychiatry at Nationwide Children's Hospital and Ohio State University, also in Columbus, said in an interview that the self-embedding behaviors "might represent one extreme of nonsuicidal

self-injury or perhaps even a distinct problem." However, he added, "this is a clinical case series—no more and no less—so we do need to be careful about making excessive generalizations."

In response to these findings, Dr. Shiels and his colleagues are working with the hospital's institutional review board and information systems department to develop a secure national registry for long-term research and sharing of case histories and radiologic images by clinicians.

The percutaneous treatment technique, which involves the insertion of small surgical instruments through a 2- to 8-mm incision and hydrodissection with lidocaine to separate the foreign object from surrounding soft tissue, results in minimal scarring, compared with traditional surgical procedures, Dr. Shiels said.

A 23-gauge lidocaine needle provides tactile feedback in confirming the object's margins. Some objects require blunt dissection with a forceps. Others are surrounded by dense scar tissue and require sharp dissection with a scalpel blade.

The procedure, which leaves scarring no larger than the size of a freckle, offers an excellent treatment option for this group of patients because it "does not complicate the psychological challenges—including body image and self-esteem issues—that these patients will encounter in their lives," Dr. Shiels said.

Radiologists removed a total of 53 foreign bodies from the soft tissues of nine adolescents ranging in age from 15 to 18 years in 15 episodes. Objects were removed from the arms (50), the foot (2), and the hand (1) with ultrasound guid-

ance alone (28 objects), fluoroscopic guidance alone (13 objects), and combined ultrasound/fluoroscopy (12 objects).

Ultrasound enabled the identification of nonradiopaque objects not detectable on x-ray. STFBs were metal (29), graphite (9), plastic (9), wood (3), stone (1), glass (1), and crayon (1), and ranged from 2-160 mm by 0.5-3 mm in size.

All 53 objects were successfully removed with a zero incidence of infection; no injury to nerves, tendons, or vascular structures; and no other complications.

Dr. Shiels said Nationwide Children's Hospital has established an interdisciplinary initiative for "self-embedders" led by professionals from the hospital's behavioral health service that focuses on early recognition and intervention.

"The radiologist is often in the unique position to make the diagnosis," he said. "Parents are often unaware of what's going on, and health providers, pediatricians, ER physicians don't know what's going on. The radiologist can take one look at the x-ray and immediately mobilize an interdisciplinary health care team to intervene in this patient's life and hopefully stop the cycle of self-harm."

He emphasized the need for education about early detection because "we are in a new era of communication where kids can communicate instantly across the country through Facebook and other media, so they can talk to each other—not only about how they are being cared for but also, possibly, how to do it."

Requests for access to the registry should be sent to Dr. Shiels at William.Shiels@nationwidechildrens.org. ■

## Teenage Menstruation: What's Normal and What's Not?

BY SHERRY BOSCHERT  
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STANFORD, CALIF. — A teenage patient complains of "heavy" menstrual periods. Her mother mentions that her daughter never gets periods during soccer season.

Should you evaluate the girl for abnormal uterine bleeding? Or is a bit of hand-holding going to be enough in this situation?

Test your knowledge of what's normal or abnormal for teenage menstruation by taking the true or false quiz (see box) before reading the commentary below.

The average ages at which girls reach puberty and menarche have been trending downward and vary by race, said Dr. Paula J. Hillard at a pediatric update sponsored by Stanford University.

Puberty and menarche generally arrive several months earlier for African American girls than for white girls, studies in the past decade have shown. While only 7% of white girls had "early" breast development or pubic hair by age 7 years, this occurred in 27% of African American girls (*Pediatrics* 1997;99:505-12).

Guidelines suggest not evaluating for precocious puberty unless breast devel-

opment or pubic hair occurs before age 7 years in white girls or before age 6 years in African American girls. If there are other signs or symptoms such as severe headache or neurologic symptoms, an evaluation is in order. "It could be a brain tumor," said Dr. Hillard, professor of obstetrics and gynecology at the university.

The age at which girls start their periods has been declining since 1800. Declines in the age of menarche up until the 1960s resulted from positive changes such as better nutrition and less infectious disease. Since then, however, declines in the age of menarche seem to be related to negative changes such as overeating and limited physical activity, resulting in obesity. Chemical pollution also may be playing a role, and is an active area of research, she said.

Over the past 20 years, the age of menarche declined by 2 months in white girls and by more than 9 months in African American girls. Federal data in 1999-2002 showed the average age of menarche to be 12.5 years in whites and 12.1 years in non-Hispanic blacks and Mexican Americans (*J. Pediatr.* 2005; 147:753-60). The duration of menstrual bleeding has held steady, lasting 2-7 days per period in 92% of teen girls.

Evidence-based medicine suggests that "early" or "late" menarche can be defined as 2.5 standard deviations from the mean (ages 9 or 15 years for white girls), said Dr. Hillard, who did not have similar data for African American girls.

An evaluation would be appropriate if a girl has no menses by age 15 years. An evaluation also is warranted if there's no breast development by age 13 years, if menses haven't started 2.5-3 years after breast development, or if the patient is 14 years old with obesity, moderate to severe acne, and hirsutism.

Consider polycystic ovarian syndrome

(PCOS) or anorexia nervosa or other eating disorders as possible causes. If the mother says her daughter never gets periods during soccer season, "this may be cause for concern," Dr. Hillard said.

Early menstrual cycles in a girl's life may be anovulatory and shorter or longer than some others; they should not be chaotically irregular. Most cycles average 21-45 days in the first gynecologic year and trend toward shorter, more regular cycles with age. Beyond 90 days, evaluate for PCOS, eating disorders, thyroid disease, hyperprolactinemia, gonadal dysgenesis, or premature ovarian failure. ■

### True or False Menstruation Quiz

1. The average age of puberty has been declining.
2. Pubertal development at about age 8 years constitutes precocious puberty.
3. Girls begin menstruating at an average age of 13 years.
4. The average age of menarche has been declining.
5. Normal menstrual periods last 2-7 days.
6. A girl who has not started menstruating by age 15 years should be evaluated.
7. In the first year of menses, it's normal to have anovulatory or chaotically irregular cycles.
8. Menstruation typically cycles every 21-45 days, but a 90-day cycle also is normal.

Quiz Answers: 1. True, 2. False, 3. False, 4. True, 5. True, 6. True, 7. False, 8. True