

Self-Embedding Behavior: A New Primary Care Challenge



WHAT'S KNOWN ON THIS SUBJECT: Self-embedding behavior is an extreme form of self-injury involving the insertion of inanimate objects into the soft tissues, either under the skin or into muscle. To date, no case series data on this behavior among adolescents has been described in the pediatric medical literature.



WHAT THIS STUDY ADDS: Goals of this study are to begin to develop a clinical picture of adolescents who engage in self-embedding behavior, resulting in an understanding that allows practitioners to pursue rapid and targeted intervention to interrupt the cycle of self-harm and institute appropriate long-term therapy.

abstract

FREE

OBJECTIVE: The goal of this study was to define self-embedding behavior (SEB), develop a clinical profile of adolescents who engage in SEB, and emphasize the importance of rapid, targeted, and effective identification and intervention.

METHODS: As part of a retrospective study with a database evaluating 600 patients percutaneously treated for soft-tissue foreign body removal, adolescents were identified with self-embedded soft-tissue foreign bodies. We describe patients' gender, age, and psychiatric diagnoses; SEB age of onset, frequency, and self-reported reasons; and the number, type, location of, and removal technique for objects.

RESULTS: Eleven patients (9 females) who engaged in SEB were identified. Ten of the 11 patients were members of a group home or psychiatric facility at the time they engaged in SEB. All patients had previous and multiple psychiatric diagnoses. SEB mean age-of-onset was 16 years, and mean number of SEB episodes per patient was 1.9. The most common self-reported purpose for SEB was suicidal ideation (6 of 8 [75%]) versus nonsuicidal ideation (2 of 8 [25%]), with 3 cases lacking this documentation. The mean number of objects embedded in a single episode was 2.4, usually composed of metal and embedded in the arm. Seventy-six foreign bodies were percutaneously removed (using ultrasound or fluoroscopic guidance), including metal, glass, wood, plastic, graphite, and crayon.

CONCLUSIONS: SEB is an extreme form of self-injury requiring aggressive and timely interdisciplinary assessment and treatment. An understanding of SEB allows medical professionals to pursue rapid, targeted, and effective intervention to interrupt the cycle of self-harm and institute appropriate long-term therapy. *Pediatrics* 2011;127:e1386–e1391

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KEY WORDS

self-injury, self-embedding, adolescent, foreign body

ABBREVIATION

SEB—self-embedding behavior

Portions of this work were presented at the American Academy of Pediatrics National Conference and Exhibition; October 16–20, 2009; Washington, DC.

The findings and conclusions in this report are those of the authors and do not necessarily represent the views of the American Academy of Pediatrics.

www.pediatrics.org/cgi/doi/10.1542/peds.2010-2877

doi:10.1542/peds.2010-2877

Accepted for publication Feb 14, 2011

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PEDIATRICS (ISSN Numbers: Print, 0031-4005; Online, 1098-4275).

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FINANCIAL DISCLOSURE: The authors have indicated they have no financial relationships relevant to this article to disclose.

Self-injury is a common occurrence in diverse patient populations.¹⁻⁴ Self-injury refers to a broad class of experiences (suicidal and nonsuicidal) in which people engage in behavior that directly and deliberately destroys one's own body tissue.⁵ This trend is not new or a phenomenon in adolescents; acts include cutting, burning, carving, hair pulling, inserting objects in body orifices, skin picking, and scratching.⁶⁻⁸ Common sites of self-injury include the arms, wrists, ankles, and lower legs.²⁻⁴

Often misdiagnosed, ignored, or underreported, self-embedding behavior (SEB) is a form of self-injurious behavior involving the insertion of inanimate objects into the soft tissues, either under the skin or into muscle. Originally described in their book *Anomalies and Curiosities of Medicine*, Gould and Pyle⁹ compiled reports on adult European females with hysteria who demonstrated SEB ("needle-girls"). Favazza¹⁰ noted that the "practice of sticking needles into the skin is still encountered although not often written about."

Although several commonly used adolescent self-injury assessments contain questions regarding "inserting objects under nails or skin," to the best of our knowledge, no case series data on SEB among nondevelopmentally delayed adolescents have been described in the pediatric medical literature. This lack of knowledge limits our understanding of how to appropriately identify, assess, and treat SEB in this population. Medical professionals have the unique opportunity to be the first to identify and distinguish SEB from other forms of self-injury, and must understand that this behavior is a manifestation of a larger psychological problem and therefore needs a timely and appropriate psychological and/or psychiatric referral.

To begin to develop a clinical picture of adolescents who engage in SEB, the

goals of this article are to describe patients' gender, age, comorbid psychiatric diagnoses, and referral service; age of onset, frequency, and self-reported reasons for SEB; and the number, type, location of, and removal techniques for foreign bodies.

METHODS

Institutional review board approval was obtained for this retrospective chart review study of a database of patients undergoing interventional radiologic treatment of soft-tissue foreign bodies. Of the 600 patient files examined, the majority of which were accidental injuries, 11 patients were identified who had embedded foreign

bodies into their skin, subcutaneous tissue, or muscles. These incidents occurred over a 3-year period between May 2005 and December 2008. The patients presented, in most instances, to the emergency department for evaluation of the foreign bodies as a result of pain or infection. In 2 of the 11 patients, emergency department physicians removed the self-embedded foreign bodies, whereas the other 9 patients were referred to the Department of Radiology for diagnosis and subsequent percutaneous removal of the foreign bodies under sonographic or fluoroscopic guidance. Foreign bodies were documented and kept for additional analysis,



FIGURE 1 Wrist radiographs of a 17-year-old female (with borderline personality disorder) with 6 metal staples (arrows) embedded in the soft tissues. A, anteroposterior; B, lateral.

including measurement and classification. Patient chart reviews were conducted, including documentation of patient history, patient comments, and pertinent medical diagnoses (specifically, behavioral health comorbidities).

RESULTS

Eleven adolescent patients, ranging in age from 14 to 18 years (mean: 16 years), demonstrated SEB with 21 foreign body removal encounters. Of the patients encountered in our study, 9 of 11 (82%) were female. Ten of the 11 patients had a history of out-of-home placements and were members of a group home or psychiatric facility at the time they engaged in SEB. Most patients (73%) were referred from the emergency department. On presentation, patients exhibited infection (cellulitis and suppuration) but no abscesses at the insertion site. The majority (64%) presented with irritation in the area adjacent to the initial site of cutting and insertion. Other reasons for presentation included patient's admission of self-embedding foreign bodies or others reporting witnessing the patient engaging in SEB. All patients had previous and multiple psychiatric diagnoses (mean: 3.4; range: 1–7), including bipolar disorder (100%), posttraumatic stress disorder (PTSD) (64%), depression (45%), borderline tendencies (45%), attention-deficit/hyperactivity disorder (36%), conduct disorder (18%), panic disorder (9%), obsessive-compulsive disorder (9%), and overanxious disorder (9%).

The mean number of SEB episodes per patient was 1.9 (range: 1–4), with 45% repeating SEB and a mean duration between episodes of 63 days. The most common self-reported purpose for SEB was suicidal ideation (6 of 8 [75%]) versus nonsuicidal ideation (2 of 8 [25%]), with 3 cases lacking this documentation. The mean number of objects embedded in a single episode was 2.4 (range: 1–11).

Embedded foreign body compositions include metal (Fig 1), glass (Fig 2), graphite, wood, and plastic (Fig 3 and Fig 4), and crayon (Table 1). The injury site distribution was arm, 91% (69 of 76); neck, 5% (4 of 76); foot/ankle, 3% (2 of 76); and hand, 1% (1 of 76) (Table 1). Of 11 patients, 2 underwent 5 episodes of foreign body removal by emergency

medicine physicians without image guidance; 4 foreign bodies were removed from the neck (Fig 2) and 2 from the arm. In the remaining 9 patients, 70 foreign bodies were percutaneously removed with sonographic or fluoroscopic guidance by the radiologist. All of the foreign bodies were removed without complications.

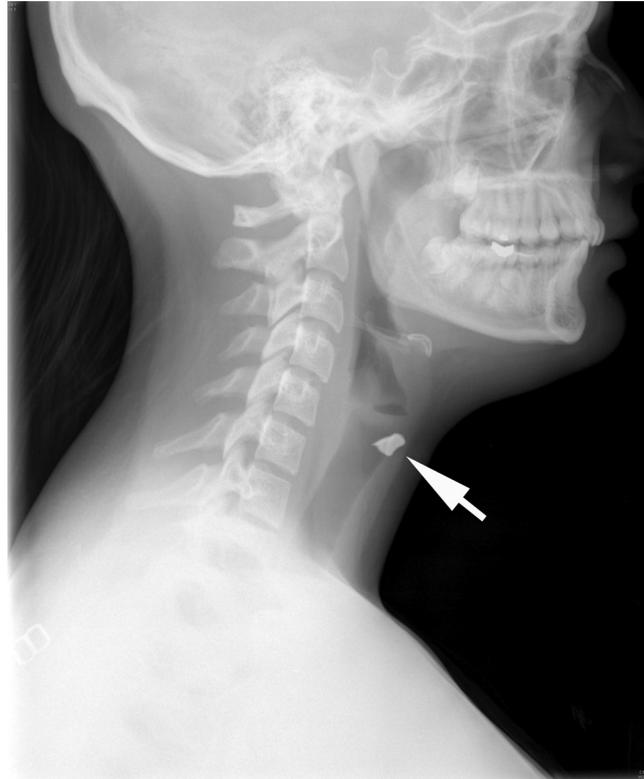


FIGURE 2 Lateral neck radiograph of a 17-year-old patient shows a large fragment of glass (arrow) embedded in the neck.



FIGURE 3 Sonogram of the arm (15-year-old female) shows a generous linear fragment of graphite (arrow) during ultrasound-guided foreign body removal.

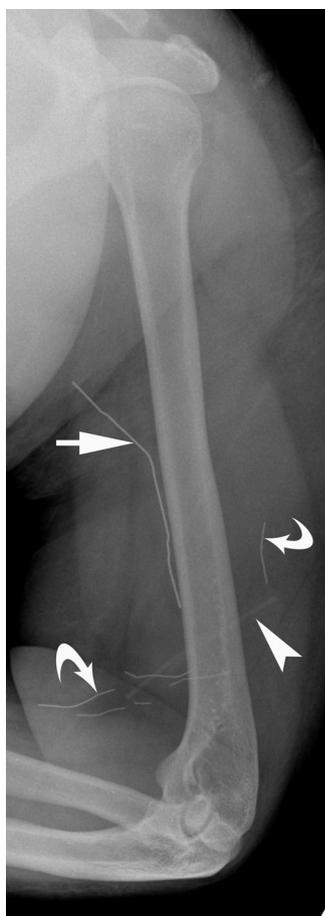


FIGURE 4

Lateral arm radiograph shows 9 foreign bodies, including a 16-cm unfolded paperclip (straight arrow), graphite fragments (arrowhead), and staples (curved arrows), embedded in the arm of a 17-year-old patient with multiple behavioral health diagnoses, including borderline personality disorder, PTSD, and depression.

DISCUSSION

Although soft-tissue foreign body injuries are common, SEB is less common and virtually undocumented in pediatric medical literature. This lack of knowledge limits our understanding of how to appropriately identify, assess, and treat SEB in this population. Therefore, the overarching aim of the present study was to begin to develop a clinical profile of adolescents who engage in SEB and to distinguish it from other forms of self-injury.

A distinction can be made between SEB and other forms of nonsuicidal self-injury. With nonsuicidal self-injury, pa-

TABLE 1 SEB Patient Encounters

Patient	Behavioral Diagnoses	Age	No. of Episodes	No. of FBs	FB Insertion Site	FB Object
A	PTSD BPD Depression Bipolar II disorder	17	1	6	Arm	Staple
B	Bipolar affective disorder ADHD Overanxious disorder PTSD Conduct disorder	17, 18	2	2	Arm	Paper clip, staple
C	Bipolar disorder Depression	15	1	2	Foot/ankle	Staple
D	BPD Bipolar II disorder PTSD	17	1	1	Arm	Unknown
E	PTSD Bipolar II disorder BPD Panic disorder	16, 17, 18	4	35	Arm	Staple, comb, tooth, Cotter pin, pencil lead, paperclip, crayon, nail polish wand, unknown
F	PTSD Bipolar disorder BPD	17	1	1	Hand	Staple
G	ADHD Bipolar disorder	15	1	2	Arm	Pencil lead
H	PTSD Bipolar disorder Obsessive-compulsive disorder Depression	17	3	16	Arm	Comb tooth, paperclip, staple, pencil lead
I	ADHD Bipolar disorder	18	2	3	Arm	Pencil lead, paperclip
J	PTSD ADHD BPD Narcissistic personality disorder Bipolar disorder Conduct disorder Depression	17, 18	4	4	Neck	Light bulb, glass, bobby pin, unknown
K	Depression Bipolar disorder	14	1	4	Arm	Unknown

Ages listed denote age at time of the encounter. FB indicates foreign body; BPD, borderline personality disorder; ADHD, attention-deficit/hyperactivity disorder.

tients intentionally damage their own body in the absence of the intent to die.⁵ It is hypothesized that this action generates desired feelings or stimulation of positive reinforcement and help seeking⁵; the goal is to feel better. In contrast, SEB is performed with the intent to seriously harm and, in most cases, with accompanying suicidal ide-

ations. The distinction between these 2 forms of self-injury is paramount, with SEB posing a potentially greater risk to patients.

Similar to adolescents who engage in suicidal self-injury¹¹ and nonsuicidal self-injury,¹² patients who demonstrate SEB are mostly white, teen-aged

females with multiple psychiatric diagnoses. Ten of the 11 patients had a history of out-of-home placements and were members of a group home or psychiatric facility at the time they engaged in SEB, which is in accord with the literature on adolescent self-injury in residential treatment settings.¹³ The mean age of onset for SEB in our sample (16 years) was similar to that for adolescent nonsuicidal self-injury (13–15 years)¹⁴ and suicidal self-injury (15–17 years).¹⁵ Also comparable were the number of repeated events and duration between episodes.^{12–18}

Awareness of SEB is paramount for rapid and effective identification, assessment, and interruption of the cycle of self-injury. Interventions include removal of the foreign body as well as long-term management of the patient. Management of patients with SEB includes mobilizing a multispecialty team; because of the complexity of the care that is required, the team consists of primary care and emergency physicians, behavioral health specialists, and interventional radiologists. Thus, interdisciplinary treatment must immediately interrupt the cycle of self-harm and subsequently remove the foreign bodies, using fluoroscopic or

sonographic guidance if necessary. Radiographs and fluoroscopy can detect radiopaque objects such as glass, metal, and graphite foreign bodies, but not wood or plastic, which are radiolucent. Sonography is able to detect non-radiopaque objects such as wood and plastic, as well as radiopaque objects, and may be used to guide percutaneous removal.^{19–22}

Limitations of the present study include its small sample size ($N = 11$); a homogeneous sample, obtained from a single source (a large quaternary children's hospital radiology department from 2005–2008) and characterized by patients in out-of-home placements; and use of retrospective data restricted to contents of a clinical chart. In particular, although all of the study patients had diagnoses of bipolar disorder, the clinical chart did not include data pertaining to whether SEB occurred during a manic episode. Despite limitations, our results suggest a few factors medical professionals need to be aware of regarding the presence of adolescent SEB; learn how to screen for, assess, and distinguish SEB from other forms of self-injury (including risk of suicidality versus non-suicidality), and make timely and

appropriate mental health and radiologic referrals. In addition, these mental health professionals need to work with their patients to find alternative, safer, and healthier coping strategies to SEB to meet the same function. They must also assess and treat the high degree of comorbidity associated with SEB.

CONCLUSIONS

Future directions for research on SEB include establishing standardized instruments for medical professionals to prospectively examine SEB in larger and more representative samples; additional exploration of the suicidal or nonsuicidal intent of SEB; investigating specific risk and protective factors, functions, and the long-term course of SEB; building and testing associated theoretical models; and developing evidence-based assessment instruments and multidisciplinary treatments.

SEB is an extreme form of self-injury requiring aggressive and timely interdisciplinary assessment and treatment. An understanding of SEB allows medical practitioners to pursue rapid, targeted, and effective intervention to interrupt the cycle of self-harm and institute appropriate long-term therapy.

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Pediatrics 2011;127:e1386

DOI: 10.1542/peds.2010-2877 originally published online May 9, 2011;

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