Stress is a commonly experienced by college students. Student-athletes face the additional demands associated with participation in a competitive sport. When an injury occurs, concern about status on the team can create stress and medical appointments can impose even greater time demands.

Multiple stressors can affect student-athletes in different ways, which may be manifested by extreme anxiety, frustration, irritation, and/or fear related to the sport. Physical symptoms may include insomnia, persistent tension, fatigue, headaches, digestive disturbances, and hair loss. Alopecia (i.e., hair loss) is an uncommon condition among collegiate athletes. In the general population, telogen effluvium is the second most common type of hair loss presented to dermatologists. Telogen effluvium can result from physiological stress imposed by orthopedic surgery. Very little research has been done to better understand this condition. In healthy individuals, hair follicles continually go through three phases: anagen (growth), catagen (involution), and telogen (rest). The anagen phase can last 2–8 years, the catagen phase lasts 4–6 weeks, and the telogen phase lasts 2–3 months. A final exogen phase involves release of the dead hair follicle from the scalp. Each hair follicle independently goes through each of these phases at different times, which maintains stable hair density. The shedding of 100–150 telogen hairs per day is normal.

Telogen effluvium is a subtype of alopecia that occurs during the telogen phase. The hair loss is dispersed evenly throughout the scalp. The causes of telogen effluvium include major psychological or physiological stress, or chronic systematic disease processes. The purpose of this report is to present a unique clinical manifestation of acute telogen effluvium in a female student-athlete who experienced multiple stressors.

### Case Report

**Background**

A 22-year-old female collegiate distance runner reported hair loss over the previous two months to an athletic trainer. She reported having been able to pull out handfuls of hair strands when washing or combing her hair. She was self-treating her symptoms by limiting hair grooming activities to washing only twice per week and combing only once per week. She also reported wearing her hair pulled back in a ponytail in an attempt to conceal hair loss from peers.

**Patient History**

The patient was a successful distance runner (averaging 75–80 miles per week). Like many female distance runners, she followed a restrictive diet, but she had never been diagnosed with an eating disorder. She also

---

**Key Points**

- Hair loss (alopecia) is uncommon in a young, healthy population.
- Alopecia can result from psychological and/or physiological stress.
- Telogen effluvium can result from physiological stress imposed by orthopedic surgery.
reported a history of oligomenorrhea. The female athlete triad is a spectrum disorder that adversely affects energy availability, menstrual function, and bone mineral density. The patient was below an optimal level of energy availability, but not to the extent associated with a clinically diagnosed eating disorder. The patient denied eating disorder behaviors, such as purging or food rituals. Despite limitations imposed by these abnormalities, she had been competing at an elite level for her entire collegiate career.

Five months prior to complaints of hair loss, this patient underwent surgery to reconstruct her lateral ankle ligaments. At the time of hair loss onset, the patient was beginning a return-to-running program, along with a cross-training regimen. She reported feeling a great deal of pressure from coaches and the running community to return to her previous performance level as quickly as possible. She also disclosed that she had high expectations of herself in her academic and personal life, which increased her overall stress level.

She reported a family history of hyperthyroidism in her mother and maternal aunt. The mother's symptoms, which included hair loss, began in her mid-twenties, and they resolved after initiation appropriate treatment with medication. No other family history of autoimmune disease or cancer was reported. Currently, the patient was taking a daily multivitamin, as well as taking calcium-magnesium and vitamin D at least four times a week for bone health. Due to previous anemia, she also was taking supplemental iron, but her iron level was normal at time of hair loss. She also had started taking biotin (vitamin B7) for its promoted benefits to hair health.

**Physician Evaluations**

The patient’s first medical evaluation was performed by the primary care team physician, who did not observe any obvious area of alopecia, broken hair follicles, dandruff, or other abnormal findings. However, the patient was anxious and became tearful when hair loss was discussed. Due to her emotional response, the hair-pull test was not performed. Differential diagnoses included telogen effluvium, a thyroid condition, eating disorder, complications associated with the female athlete triad, and/or an autoimmune disorder. Blood analysis included a thyroid panel, complete blood count (CBC), and nutritional status, all of which yielded values that were within normal limits. The use of oral contraceptives was recommended, but the patient refused for personal reasons. She was subsequently referred for evaluation by a dermatologist.

The scalp examination performed by the dermatologist did not reveal erythema or evidence of scarring. Her hair density was judged to be within normal limits, with fine hair growth on the periphery of the scalp. The dermatologist’s diagnosis was acute telogen effluvium, which was believed to be due to the physiological and emotional stress of surgery and recovery. The presence of fine hairs growing on the periphery of the scalp was interpreted as a sign that normal hair should begin to reappear within 1–3 months.

**Discussion**

The reported case of telogen effluvium is unique, because hair loss is not a common condition in the college-aged population. The multiple stressors and family history made determination of the cause of the hair loss difficult. Telogen effluvium most often develops when a high level of physiological stress has been imposed by a major surgery, a weight-reducing diet, an increase in athletic conditioning or physiological stress, severe emotional distress, pregnancy and/or changes in medications (Table 1). Hair loss does not occur immediately after the onset of stress. Due to the hair growth cycle, hair loss typically occurs 2–4 months after the onset of physiological stress. After the physiological stress is removed, or the body adapts to the stress, the hair will generally begin to grow back within 6 months. However, chronic telogen effluvium can persist for several years, which may develop secondary to a systematic disease process, such as hyperthyroidism.

Diagnostic tests for telogen effluvium include the hair-pull test and blood analysis. The hair-pull test is performed by grasping a small section of hair (approximately 60 hairs) between the thumb, index finger, and middle fingers near the scalp. The hair is pulled firmly from the scalp to the end of the strand using consistent traction. A normal test results in less than five hairs being pulled loose, whereas an abnormal result consists of greater than six hairs (~10% of hair pulled) separating from the scalp. To enhance the accuracy of the hair-pull test result, the patient should refrain from washing the hair on the day of the test. Blood analysis should include serum ferritin and thyroid-stimulating hormone levels.

In the reported case, the patient was subjected to many stressors that could have produced hair loss.