

A move towards eradicating incompletely excised sarcomas - "A tale of two cities"

Krishna Reddy, Ginger Holt, Robert Grimer, Jennifer Halpern, Herbert Schwartz

Vanderbilt University Medical Center, Nashville, USA & Royal Orthopaedic Hospital, Birmingham, UK

Introduction:

Soft-tissue sarcomas (STS) comprise <1% of all malignancies with 50% occurring in extremities. Given the rarity of these tumors, inappropriate evaluation and treatment by a multitude of surgical specialties (general surgeons, Orthopedists and plastic surgeons) is not uncommon with reported rates in literature suggesting this in up to 50%. The high rates of inadvertent excisions are despite modern imaging and assessment techniques. With this background, the study aims to elucidate the burden of this problem in two specialist sarcoma centers [Vanderbilt University Medical Center (VUMC), Nashville, USA and Royal Orthopaedic Hospital (ROH), Birmingham, UK] and evaluates physician training/education in the two countries to make recommendations to training to minimize the number of inadvertently excised STS.

Methods: The study established the incidence of unplanned soft tissue sarcoma referrals at the two units based on already published data from the two centers. Sarcoma education initiatives in Europe and USA were studied based on published literature and conference presentation material.

Educational initiatives at ROH: At the regional level (Pan-Birmingham region), the chief initiatives were "golf-ball" project. An ambispective cohort study of general practitioner (GP) referral patterns following the educational intervention was evaluated. The intervention included a golf ball inscribed with a message-"is this sarcoma" and a leaflet explaining all deep soft tissue masses larger than 42 mm diameter and red flag signs for STS needed a diagnosis and recommendation to be referred to sarcoma center. The pre-intervention and post-intervention referral pattern in the Pan-Birmingham region assessed using questionnaire and telephone interview with GP and referral pattern data in the two cohorts.

Educational interventions at VUMC: A case based survey used to assess clinical decisions, practice patterns and demographic data of general surgical and orthopaedic residents carried out with the aim of determining whether resident education plays a role in appropriately managing unknown soft tissue masses. The impacts of the educational interventions evaluated were assessed. Based on these, further recommendations made on improving sarcoma awareness among physicians, with a view of minimizing the risk of inadvertent excisions.

Results:

1. At VUMC, between January 2000 to December 2008, 400 STS of extremity were treated, of which 253 underwent primary excisions and 147 were incomplete excisions (36.7%). Likewise, at ROH, from January 1982 to December 2005, a total of 2201 STS were treated of which 402 were incomplete excisions (18%). The difference in the rate of incomplete/inadvertent excisions probably reflects the differences in the health care systems prevalent in the two countries.
2. Educational initiatives at ROH: There was a 37% change in referral rate in the Pan-Birmingham region pre and post-intervention (independent of population increase but not statistically significant).
3. Educational intervention at VUMC: A total of 381 responses were returned. A higher percentage of respondents from the orthopaedic group (84.2%) noted having a dedicated STS rotation as compared to the general surgery group (35.8%) $p < 0.001$. Depth, size, and location of the mass, rate of growth, and imaging characteristics were considered to be important factors. Each additional year of training resulted in 10% increased odds of selecting the correct clinical decision for both groups. However, soft tissue masses commonly referred to general surgeons, who do not have a dedicated STS rotation as a part of their curriculum!

Recommendations:

This study showed that given the overall rarity of STS, inadvertent excisions are common. The educational intervention seems to increase awareness and should be expanded to include family practitioners (GPs), general surgeons and plastic surgeons. A dedicated sarcoma rotation for residents in general and plastic surgery as well as a dedicated module in the curriculum would immensely further this cause. Any mass larger than 4 cm and deep to fascia should mandate a diagnosis before surgical excision.