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Along came a spider: medicine's most famous spider eponyms

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Abstract Spiders have long been admired for the beauty of their webs. They are celebrated in popular culture as well as in medical eponyms. This contribution provides the historical background for three spider-related eponyms: nevus araneus (spider angioma), arachnodactyly, and the arachnoid mater. Nevus araneus was first named and described by Sir Erasmus Wilson in 1842. Arachnodactyly was described in 1896 by Antoine Marfan using the term *pattes d'araignée*, which means *spider legs*. In 1902, Emile Charles Achard proposed the term *arachnodactyly* for this clinical finding. The arachnoid mater had been named in 1699 by Frederik Ruysch. The clinical management of spider bites from the only two dangerous venomous spiders within the United States, the black widow spider (*Latrodectus mactans*) and the brown recluse spider (*Loxosceles reclusa*), is reviewed.

For more than 200 years, children have enjoyed the popular nursery rhyme "Little Miss Muffet," which tells the story of a young girl who was eating her curds and whey, when "...along came a spider who sat down beside her and frightened Miss Muffet away." Although many people fear spiders, as did Miss Muffet, most spiders are harmless. In the United States, two types of venomous spiders are considered dangerous to people, black widow spiders (*Latrodectus mactans*) and brown recluse spiders (*Loxosceles reclusa*).[1]

Spiders are also admired for their magnificent and intricate webs. They have inspired one of the most popular Marvel Comics superheroes, Spider-Man. Spiders are also celebrated in the medical nomenclature. This contribution tells the story behind three famous spider-related medical eponyms: (1) nevus araneus, (2) arachnodactyly, and (3) the arachnoid mater.

It also provides a brief clinical overview of the recognition and management of spider bites from black widow and brown recluse spiders.

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Nevus araneus (spider angioma)

The first description of a spider angioma is credited to Sir Erasmus Wilson (1809-1884) (Figure 1), a distinguished English surgeon who helped found modern-day dermatology. In 1842, Wilson published his pioneering textbook of dermatology entitled, *A Practical and Theoretical Treatise on the Diagnosis, Pathology, and Treatment of Diseases of the Skin*.[2] In this work, Wilson names and describes nevus araneus (Latin for *spider nevus*) as follows:

Occasionally the vascular dilatation is limited to a mere point, from which several enlarged venules pass off in different directions. This kind of naevus [*sic*] rarely increases in size, it is met with on the face and on the limbs, and from the peculiarity of its appearance, has been named naevus araneus.[2]

Later, in 1869, Erasmus Wilson reported that he observed a number of angiomas on the face, neck, hands, and arms of a 30-year-old alcoholic *publican* (pubkeeper).[3] Wilson does not indicate whether the term *nevus araneus* originated with him or with someone else. A description that

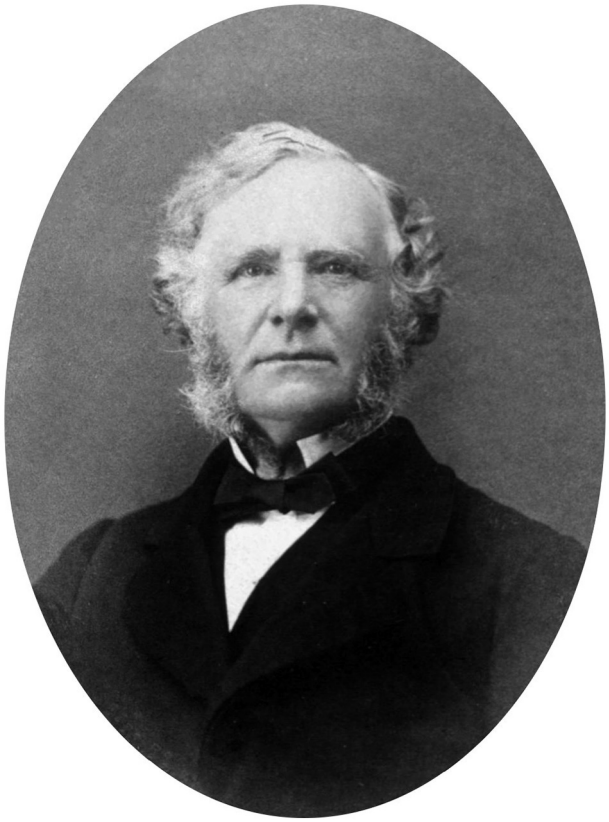

Fig. 1 Photograph of Sir Erasmus Wilson from 1874. Barraud & Jerrard, photographers.

sounds like spider angiomas appears to have been recorded in ancient Mesopotamian texts. These skin lesions were found on the patient's temples, nose, mouth, abdomen, and hands and were called *webs*.[4]

Other investigators quickly confirmed Erasmus Wilson's observation that spider angiomas are often seen in alcoholic patients with chronic liver disease (33% prevalence in cirrhosis). They also found that the number of angiomas correlated with the severity of the underlying hepatic disease.[3,5]

Subsequently it was reported that spider angiomas were seen in about 60% of pregnant women and were also a common finding in nonpregnant individuals. Solitary spider angiomas are found in 15% of young adults and 38% of healthy children.[5] These spider angiomas often disappear in women during the postpartum period, in children as they grow older, and in patients with liver disease if their hepatic function improves. Spider angiomas have also been noted in women who take oral contraceptives, suggesting a hormonal role in their formation. The exact cause of spider angiomas remains unknown.

A spider angioma appears as a small, pinpoint, dilated central arteriole, with radiating small vessels that resemble the legs of a spider (Figure 2). Cosmetic treatment, when necessary, uses electrodessication or laser therapy but may leave a small scar.

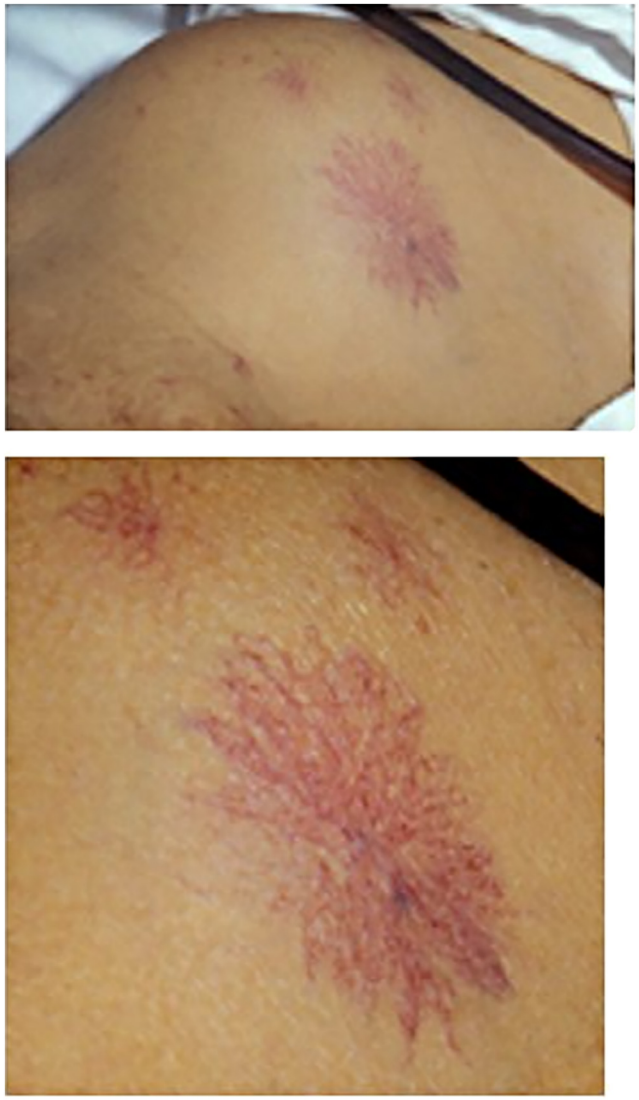

Fig. 2 Spider angiomas in a 47-year-old patient with longstanding jaundice, ascites, and biopsy-proven cirrhosis. Herbert L. Fred, MD and Hendrik A. van Dijk.

Arachnodactyly

Marfan syndrome is a generalized genetic disorder of connective tissue with ocular, skeletal, and cardiovascular manifestations. Striae may be present in the skin of the pectoral, deltoid, and thigh areas. Skeletal findings include excessively long tubular bones and excessively long finger bones, termed arachnodactyly (Greek for *spider fingers*). Persons with arachnodactyly often have a positive wrist sign: they can wrap the thumb and fifth finger of one hand around the opposite wrist such that the nail beds of the two digits overlap with each other.

Marfan syndrome is caused by a mutation to the gene that makes fibrillin 1 (*FBN1* gene), a glycoprotein that is essential to the formation of elastin fibers found in connective tissue. The disorder is inherited in an autosomal dominant pattern but can be the result of a spontaneous mutation.

There are, in addition to Marfan syndrome, several different genetic disorders that present with arachnodactyly, and these include congenital contractural arachnodactyly and Achard syndrome. Congenital contractural arachnodactyly is caused by a mutation in the fibrillin 2 gene (*FBN2* gene). Patients present with arachnodactyly, contracted fingers and toes, crumpled ears, and kyphoscoliosis. It is inherited as an autosomal dominant trait. Achard syndrome is a rare disorder characterized by arachnodactyly, receding lower jaw, joint laxity of the hands and feet, broad skull, and brachycephaly. The following is the story behind the medical term *arachnodactyly*.

In 1896, the French pediatrician Antoine Marfan (1858-1942) described the case of a 5-year-old girl named Gabrielle, who had long bones and elongated, curved, contracted fingers that gave the appearance of spider legs (*pattes d'araignée*) (Figures 3,4).[6] It is now thought that Gabrielle suffered from congenital contractural arachnodactyly, not Marfan syndrome.[7] In 1902, the French internist Emile Charles Achard (1860-1944) described an 18-year-old woman with long, thin fingers, and proposed the term arachnodactyly to describe her disorder.[8]

Arachnoid mater

The arachnoid mater is the middle layer of the three meninges. The term *arachnoid* is derived from the Greek word meaning "in the image of a spider or its web." With respect to the meninges, the term arachnoid describes the spider web–like appearance of the delicate fibers of the arachnoid mater, which extend down through the subarachnoid space and attach to the pia mater.

The naming of the arachnoid mater has been attributed to Frederik Ruysch (1638-1731), a Dutch anatomist who described the full covering of the brain in 1699.[9] Ruysch demonstrated the spider web–like morphology of the arachnoid mater by using a straw to blow air under it; however, the arachnoid membrane had already been described in antiquity by the Greek physician and pioneering anatomist Herophilus (335-280 BCE) and subsequently by other anatomists during the 1500s and 1600s.[9]

Fig. 3 Illustration from Antoine Marfan's 1896 contribution showing the curved, contracted, and elongated fingers of his 5-year-old patient. Marfan described them as *pattes d'araignée* because they resembled spider legs.

Fig. 4 Photograph from Antoine Marfan's 1896 contribution[6] of Gabrielle, age 5 years, who appears to have suffered from congenital contractural arachnodactyly.

In Greek mythology, the name Arachne belonged to a maiden who excelled in weaving, and who challenged the goddess Athena to a weaving contest. According to one version of the myth, Arachne wins the contest but winds up being transformed into a spider who exercises her weaving skills by spinning cobwebs.

Dangerous spiders in the United States

In the United States, bites from black widow spiders and brown recluse spiders are considered the most clinically dangerous, although deaths from such bites are rare.[1] The following discussions highlight some key points concerning the identification of these venomous spiders and the clinical management of their bites.

Black widow spiders (*Latrodectus mactans*)

Black widow spiders (*Latrodectus mactans* and related species) are found throughout North America, most commonly in the Southern and Western areas of the United States. They often inhabit woodpiles, sheds, basements, and outdoor privies. Only the female is dangerous and, when

grown, exhibits a red or orange hourglass marking on the ventral surface of the abdomen (Figure 5). Its bite is typically painful and can cause some local swelling. First aid includes washing the bite with soap and water and applying a cloth filled with ice to control pain and swelling. The tetanus booster should be updated. A topical antibiotic can be applied to the bite wound. Most people do not suffer any significant damage, but some people may develop serious systemic clinical manifestations from the spider's venom. The venom is a neurotoxin (latrotoxin) that can cause widespread pain, muscle rigidity, vomiting, sweating, and shortness of breath. The findings may increase in severity for several hours and then slowly become less severe over 2 or 3 days. Some patients have residual signs and clinical manifestations (weakness, tingling, nervousness, and transient muscle spasm) lasting for several weeks.[10] Treatment of the acute clinical manifestations includes hospitalization with the use of muscle relaxants, pain medication, and antivenin.

Brown recluse spider (*Loxosceles reclusa*)

The brown recluse spider (Figure 6) is most commonly found in the Midwestern and Southern United States. It inhabits woodpiles and sheds, closets, garages, and cellars. It has a dark violin-shaped marking on the dorsum of its cephalothorax. It also has six equal-size eyes (most spiders have eight eyes). Bites can cause localized pain and a small white blister, or the bite may not be initially felt. Most bites are minor, and first aid care is the same as previously mentioned. The brown recluse spider venom, however, can cause serious skin necrosis (Figure 7). In such cases, the bites become painful over 2 to 8 hours, worsening with time and followed by dermonecrosis that develops over the next few days. A deep ulcer may result, which may take months to heal and cause scar formation. Occasionally, the brown recluse toxin can cause systemic involvement with hemolysis, disseminated intravascular coagulation, fever, and rhabdomyolysis.[11] Treatment of the skin necrosis involves expert wound care with surgical removal of the dead tissue and treatment of secondary infection. Skin grafting may be required to cover the skin defect.

Fig. 5 Black widow spider with red-orange hourglass mark on her abdomen. (Source: Public Health Image Library).

Fig. 6 Brown recluse spider with violin-shaped marking on its cephalothorax (Source: Public Health Image Library).

Conclusions

Spiders continue to be enjoyed in popular culture, from nursery rhymes such as "Little Miss Muffet," to comic book superheroes, such as Spider-Man. Spiders, through their carefully constructed webs, add a measure of beauty to the world, although the bites of black widow spiders and brown recluse spiders need prompt medical attention.

Fig. 7 Photograph of a patient 4 months after a brown recluse spider bite showing localized tissue necrosis, as can be seen on the skin of her medial right calf. (Source: Centers for Disease Control and Prevention).

Spiders have also lent their name to three famous medical eponyms: nevus araneus, arachnodactyly, and the arachnoid mater; eponyms that still enjoy widespread use many years after they were introduced by some of medicine and dermatology's finest teachers.

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