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## Modern Surgery - Chapter 5. Surgical Fevers

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## V. SURGICAL FEVERS.

THE surgeon encounters fever as a result of an inflammation or an aseptic wound, in consequence of infection, and in certain maladies of the nervous system. It is important to remember that, while elevated temperature is generally taken as a gauge of the intensity of fever, it is not a certain index. There may be fever with subnormal temperature (as in the collapse of typhoid or pneumonia), and there may be elevated temperature without true fever (as in certain diseases of the nervous system). It is true, however, that elevation of temperature is almost always noted, and is usually accepted as the measure of the height of the fever.

*The essential phenomena of fever*, according to Maclagan, are—(1) wasting of nitrogenous tissue; (2) increased consumption of water; (3) increased elimination of urea; (4) increased rapidity of circulation; and (5) preternatural heat.

**Traumatic fevers** follow a traumatism and attend the healing or infection of a wound. The forms are—(1) benign traumatic fever; (2) malignant traumatic fever.

**Benign traumatic fever** is divided into two classes—the aseptic and the septic. There is but one form of aseptic fever, the post-operation rise. The septic benign fevers are surgical fever and suppurative fever. The malignant traumatic fevers are sapremia, septic infection, and pyemia. In this section we discuss only the benign fevers.

**Aseptic fever** often, but not always, appears after a thoroughly aseptic operation and after a simple fracture or a contusion. It is not preceded by a chill, by chilliness, or by a feeling of illness. It may appear during the evening of the day of operation or not until the next day, and reaches its highest point by the evening of the second day (100° to 103° F.). This elevation is spoken of as the "post-operation rise." Besides the elevated temperature there are no obvious symptoms; the patient feels well, sleeps well, and often wants to sit up; there are no rigors and there is no delirium. The wound is free from pain and appears entirely normal. Blood examination may show moderate leukocytosis. This fever is due to absorption of pyrogenous material from the wound area, the material being obtained from clot or inflammatory exudate, or from both. Many observers believe that the pyrogenous element is fibrin ferment, which is absorbed from disintegrating blood-clot and coagulating exudate. Warren thinks the fever is due to fibrin ferment, and "also to other substances slightly altered from their original composition during life." Some have asserted that the fever is due to nervous shock.

Schnitzler and Ewald have recently studied aseptic fever.\* These observers maintain that aseptic fever can exist when no fibrin ferment is free in the blood, that fibrin ferment can be free in the blood when there is no fever, and, in consequence, that fibrin ferment is not the cause of the elevation of temperature. They rule out of consideration nervous shock as a cause, and assert that a combination of several factors is responsible,

\* See *Archiv für klinische Medicin*, Bd. liii, H. 3, 1896; also statement of their views in *Medical Record*, Dec. 19, 1896.

nucleins and albumoses which are set free by traumatism being looked upon as the most active causative agents. The presence of nuclein in the blood in aseptic fever is indicated by leukocytosis and by the increase of the alloxur bodies (including uric acid) in the urine. The capacity of nucleins and albumoses to cause fever is greater in the tuberculous than in the nontuberculous. The diagnosis of aseptic traumatic fever is only made after a careful examination has assured the surgeon there is no obscure or hidden area of infection.

In some cases aseptic fever may appear after an operation, and later be replaced by a septic fever. If the temperature remains high after a few days, if other symptoms appear, or if after the temperature becomes normal it again rises, the wound should be examined at once, as trouble almost certainly exists.

**True traumatic or genuine surgical fever** is seen as a result of infected wounds where there is decided inflammation, but no pus. The real cause is the presence of fermentative bacteria in the wound and the absorption of their toxic products. The most active and commonly present organisms are those of putrefaction. Surgical fever ceases as soon as free discharge occurs, and the appearance of such a fever is an indication for instant drainage. The condition is ushered in two or three days after the operation by chilly sensations and general discomfort. The temperature rises pretty sharply, ascends with evening exacerbations and morning remissions, and reaches its height about the third or fourth day, when suppuration sets in; the temperature begins to drop when pus forms, if the pus has free exit, and reaches normal at the end of a week (see Suppurative Fever). The temperature may reach  $104^{\circ}$  F. or more, but rarely rises above  $103^{\circ}$  F. The patient has the general phenomena of fever: thirst, anorexia, nausea, dry and coated tongue, constipation, pain in the back and legs, and headache. The urine is scanty and high-colored. Blood examination usually shows decided leukocytosis. The wound is painful, tender, swollen, discolored, and often foul, and stitch-abscesses may form. Some or all of the stitches must be cut, and the area should be aseptitized, and packed with iodoform gauze or drained by a tube. The fact that this fever is apt to cease when suppuration begins led the older surgeons to hope for pus and to endeavor to cause it to form. A severe grade of surgical fever, such as arises when there is putrefaction in a large and ill-drained wound, is known as *sapremia* (page 161).

**Suppurative Fever.**—This fever, which is due to the absorption of the toxins of pyogenic organisms, occurs after suppuration has begun, is found when the pus has not free exit, and is an intoxication rather than an infection. It can follow or be associated with surgical fever, or may arise in cases in which surgical fever has not existed. Suppuration in a wound is indicated by a rapid rise of temperature—possibly by a chill. The temperature rises to a considerable height, shows morning remissions and evening exacerbations, and as it begins to fall toward morning sweating occurs. The patient is much exhausted and presents the phenomena of fever previously described. The skin about the wound becomes swollen, dusky in color, and edematous, pain becomes pulsatile, and much tenderness develops. Blood examination shows very marked leukocytosis. The wound must at once be drained and aseptitized. In a chronic suppuration, such as occurs in the mixed infection of a tuberculous area, there exists a fever with marked morning remissions

and vesperal exacerbations, attended with drenching night-sweats, emaciation, diarrhea, and exhaustion. This is known as *hectic fever*; it is really a chronic suppurative fever. The treatment of hectic fever consists in the drainage and disinfection, if possible, the excision of the infected area, the employment of a nutritious diet, stimulants, tonics, remedies for the exhausting sweats, and free access of fresh air.

**Some Other Forms of Fever Seen by the Surgeon.—Fever of Tension.**—When there is great tension upon the stitches the spots where the stitches perforate ulcerate and some fevers arise. To relieve the fever of tension cut one or several stitches. This fever is in some cases surgical, and in some suppurative, according as to whether the infective organisms cause fermentation or suppuration.

**Fever of Iodoform Absorption** (see page 27).

**Fever of Ptyalism, or Mercurial Fever** (see page 238).

**Fever of Morphinism.**—Sometimes a morphia habitué suffers from severe chills and intermittent fever of the quotidian or tertian type. The condition is usually thought to be malarial, a view which is strengthened by the common association with neuralgia; but quinin proves futile as a remedy and blood-examination gives a negative result. If we have reason to suspect that the patient is using morphia, examine the urine for the drug and wash out the stomach and examine the washing. The latter test is of value even when morphia is used hypodermatically, because that drug is excreted into the stomach.

**Fever of Cocain-poisoning** (see Local Anesthesia).

**Hepatic Fever** (see section on Liver and Gall-bladder).

**Hysterical Fever.**—This remarkable condition is occasionally, though rarely, encountered. Most of the reported cases of great hyperpyrexia are instances of simulation and fraud. It may happen that elevated temperature is the sole evidence of illness, there being no wasting or other febrile symptoms. Such elevated temperature may be attained daily for months. As a rule, hysterical stigmata can be detected. Osler points out that cases of hysterical fever "with spurious local manifestations" are very deceptive. The case may resemble meningitis, peritonitis, or some other acute inflammatory condition; but the course of the supposed malady is found to be atypical and the symptoms are observed to be variable and often anomalous. There is no leukocytosis; frequently there is an apparent increase in red cells because of vasomotor disturbance, a fall in hemoglobin, and an increased proportion of lymphocytes and eosinophiles ("Clinical Hematology," by J. C. DaCosta, Jr.).

An **emotional fever** sometimes occurs after accidents or operations. The patient may have a chill, and then develop violent headache, photophobia, and hysterical excitement, with elevated temperature.

**Malaria.**—It is wise to examine the blood in supposed septic fevers, for only by this means can malaria be excluded. It is more common to mistake sepsis for malaria than malaria for sepsis. In malaria the spleen is enlarged, the attacks exhibit periodicity, neuralgias are common associates, and quinin cures the condition.

**Surgical Scarlet Fever.**—It is maintained by some writers (notably Victor Horsley and Sir James Paget) that a child is rendered especially sus-

ceptible to scarlet fever by the shock of a surgical operation. Scarlet fever which develops after a wound, a burn, or an operation is spoken of as surgical scarlet fever. Warren quotes Thomas Smith as having had ten cases of scarlet fever in forty-three operations for lithotomy in children. The puerperal state is supposed also to predispose to scarlet fever. It is not certain whether the poison enters by the wound, or whether shock and exhaustion predispose to ordinary scarlatina, or whether ordinary scarlatina was incubating before the accident or operation. Some surgeons hold that an attack of scarlet fever after an operation is a mere coincidence. Others maintain, and with great show of reason, that a red scarlatiniform eruption appearing after an operation, rarely indicates genuine scarlet fever, but usually points to infection, as such eruptions are known occasionally to arise in septicemia. It *rarely* indicates scarlet fever, and yet it sometimes does. There is such a condition as surgical scarlet fever, as is proved by the facts that victims of the disease have been known to communicate it, and that it is often followed by "nephritis and usually by desquamation" (Holt's "Diseases of Infancy and Childhood").

Hoffa has discussed this subject elaborately. He concludes that four types of eruption can follow operation: (1) a vasomotor disturbance due to irritation of sensory nerves, and manifested by a transient urticaria or erythema; (2) a toxic erythema due to absorption of aseptic pyrogenous material from the injured area—the absorption of carbolic acid, iodoform, or corrosive sublimate, or the effect of ether; (3) an infectious rash which is sometimes found in septicemia or pyemia, and due to minute emboli composed of bacteria, which emboli lodge in the capillaries; (4) true scarlet fever, with the usual symptoms and complications, the organisms having entered by way of the wound, and the eruption often beginning at the wound edges (quoted in Warren's "Surgical Pathology"). Surgical scarlatina is aberrant. It develops rapidly, the period of incubation is extremely brief, the throat may or may not be involved. Holt tells us that the rash is usually atypical and that "the general symptoms, particularly those relating to the nervous system," are "especially severe" ("Diseases of Infancy and Childhood"). The infection is believed to be due to a specific germ, but it has not been certainly identified. Streptococci have been found in the throat, skin, and the pus from secondary otitis media.

If surgical scarlet fever develops the wound should be drained and aseptitized, and if the situation admits of it, dressed with hot antiseptic fomentations. Otherwise the treatment is the same as for ordinary scarlatina.

**Urinary Fever and Urethral Fever** (see section on Diseases of Genitourinary Organs).

**Syphilitic Fever** (see page 227).

**Thyroid Fever** (see section on Thyroid Gland).