ABSCESS

An abscess is a collection of pus that has built up within the tissue of the body. Signs and symptoms of abscesses include redness, pain, warmth, and swelling. The swelling may feel fluid-filled when pressed. The area of redness often extends beyond the swelling.

Carbuncles and boils are types of abscess that often involve hair follicles, with carbuncles being larger.

They are usually caused by a bacterial infection, often many different types of bacteria are involved in a single infection. Rarely, parasites can cause abscesses; this is more common in the developing world. Diagnosis of a skin abscess is usually made based on what it looks like and is confirmed by cutting it open. Ultrasound imaging may be useful in cases in which the diagnosis is not clear. In abscesses around the anus, computer tomography (CT) may be important to look for deeper infection.

Standard treatment for most skin or soft tissue abscesses is cutting it open and drainage. There appears to be some benefit from also using antibiotics. A small amount of evidence supports not packing the cavity that remains with gauze after drainage.

Skin abscesses are common and have become more common in recent years. Risk factors include intravenous drug use, with rates reported as high as 65% among users.

Signs and Symptoms:

Abscesses may occur in any kind of tissue but most frequently within the skin surface (where they may be superficial pustules known as boils or deep skin abscesses), in the lungs, brain, teeth, kidneys, and tonsils. Major complications may include spreading of the abscess material to adjacent or remote tissues, and extensive regional tissue death (gangrene).

The main symptoms and signs of a skin abscess are redness, heat, swelling, pain, and loss of function. There may also be high temperature (fever) and chills. If superficial, abscesses may be fluctuant when palpated; this wave-like motion is caused by movement of the pus inside the abscess.

An internal abscess is more difficult to identify, but signs include pain in the affected area, a high temperature, and generally feeling unwell. Internal abscesses rarely heal themselves, so prompt medical attention is

indicated if such an abscess is suspected. An abscess can potentially be fatal depending on where it is located.

Causes:

Risk factors for abscess formation include intravenous drug use, another possible risk factor is a prior history of disc herniation or other spinal abnormality, though this has not been proven.

Abscesses are caused by bacterial infection the common bacteria is *staphylococcus*, parasites, or foreign substances. Bacterial infection is the most common cause. Often many different types of bacteria are involved in a single infection.

Rarely parasites can cause abscesses and this is more common in the developing world.

Pathophysiology:

An abscess is a defensive reaction of the tissue to prevent the spread of infectious materials to other parts of the body.

The organisms or foreign materials kill the local cells, resulting in the release of cytokines. The cytokines trigger an inflammatory response, which draws large numbers of white blood cells to the area and increases the regional blood flow.

The final structure of the abscess is an abscess wall, or capsule, that is formed by the adjacent healthy cells in an attempt to keep the pus from infecting neighboring structures. However, such encapsulation tends to prevent immune cells from attacking bacteria in the pus, or from reaching the causative organism or foreign object.

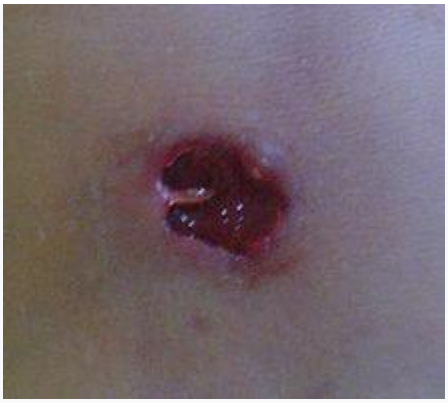
Diagnosis:

An abscess is a localized collection of pus (purulent inflammatory tissue) caused by suppuration buried in a tissue, an organ, or a confined space, lined by the pyogenic membrane. Ultrasound imaging in the emergency department can help in a diagnosis.

Treatment:

The standard treatment for an uncomplicated skin or soft tissue abscess is the act of opening and draining. There does not appear to be any benefit from also using antibiotics in most cases. A small amount of evidence did not find a benefit from packing the abscess with gauze.

1. Incision and drainage:



Abscess five days after incision and drainage

The abscess should be inspected to identify if foreign objects are a cause, which may require their removal. If foreign objects are not the cause, incising and draining the abscess is standard treatment.

In critical areas where surgery presents a high risk, it may be delayed or used as a last resort. The drainage of a lung abscess may be performed by positioning the affected individual in a way that enables the contents to be discharged via the respiratory tract. Warm compresses and elevation of the limb may be beneficial for a skin abscess.

2. Antibiotics:

Most people who have an uncomplicated skin abscess should not use antibiotics. Antibiotics in addition to standard incision and drainage is recommended in persons with *severe abscesses*, *many sites of infection*, *rapid disease progression*, the presence of *cellulitis*, symptoms indicating bacterial illness throughout the body, or a health condition causing *immunosuppression*.

People who are *very young or very old* may also need antibiotics. If the abscess *does not heal* only with incision and drainage, or if the abscess is in a place that is *difficult to drain* such as the face, hands, or genitals, then antibiotics may be indicated.

In those cases of abscess which do require antibiotic treatment, *Staphylococcus aureus* bacteria is a common cause and an anti-staphylococcus antibiotic such as flucloxacillin or dicloxacillin is used.

Alternative antibiotics effective against community-acquired MRSA often include clindamycin, doxycycline, minocycline, and trimethoprim-sulfamethoxazole.

If the condition is thought to be *cellulitis* rather than an abscess, consideration should be given to the possibility of the streptococcus

species as a cause, that are still sensitive to traditional anti-staphylococcus agents such as dicloxacillin or cephalexin.

This would be in the case of people that are able to tolerate penicillin. Antibiotic therapy alone without surgical drainage of the abscess is seldom effective due to antibiotics often being unable to get into the abscess and their ineffectiveness at low pH levels.

Prognosis:

Even without treatment, skin abscesses rarely result in death, as they will naturally break through the skin. Other types of abscess are more dangerous. Brain abscesses are fatal if untreated. When treated, the mortality rate reduces to 5–10%, but is higher if the abscess ruptures.

CELLULITIS

Cellulitis is a bacterial infection involving the inner layers of the skin. It specifically affects the dermis and subcutaneous fat.

Causes:

Cellulitis is caused by bacteria that enter and infect the tissue through breaks in the skin. Group A *Streptococcus* and *Staphylococcus* are the most common causes of the infection and may be found on the skin as normal flora in healthy individuals.

Predisposing conditions: for cellulitis include an insect or spider bite, blistering, an animal bite, tattoos, pruritic (itchy) skin rash, recent surgery, athlete's foot, dry skin, eczema, injecting drugs (especially subcutaneous or intramuscular injection or where an attempted intravenous injection "misses" or blows the vein), pregnancy, diabetes, and obesity, which can affect circulation, as well as burns and boils, though debate exists as to whether minor foot lesions contribute.

Cellulitis in the lower leg is characterized by signs and symptoms similar to those of a deep vein thrombosis, such as warmth, pain, and swelling (inflammation).

Risk factors:

The elderly and those with a weakened immune system are especially vulnerable to contracting cellulitis.

Diabetics are more susceptible to cellulitis than the general population because of impairment of the immune system; they are especially prone to cellulitis in the feet, because the disease causes *impairment of blood circulation* in the legs, leading to diabetic foot or foot ulcers. Poor control of *blood glucose* levels allows bacteria to grow more rapidly in the

affected tissue and facilitates rapid progression if the infection enters the bloodstream. *Neural degeneration* in diabetes means these ulcers may not be painful, thus often become infected.

Cellulitis is also common among dense populations sharing hygiene facilities and common living quarters, such as military installations, college dormitories, nursing homes, oil platforms, and homeless shelters.

Signs and symptoms:

Include an area of redness, which increases in size over a few days. The borders of the area of redness are generally not sharp and the skin may be swollen. While the redness often turns white when pressure is applied, this is not always the case, the area of infection is usually painful.

Lymphatic vessels may occasionally be involved, and the person may have a fever and feel tired.

The legs and face are the most common sites involved, although cellulitis can occur on any part of the body. The leg is typically affected following a break in the skin. Other risk factors include obesity, leg swelling, and old age.

The bacteria most commonly involved *streptococcus* and *Staphylococcus aureus*.

Diagnosis:

Cellulitis is most often a clinical diagnosis, readily identified in many people by history and physical examination alone, with rapidly spreading areas of cutaneous swelling, redness, and heat, occasionally associated with inflammation of regional lymph nodes.

Skin aspiration of nonpurulent cellulitis, usually caused by streptococcal organisms, is rarely helpful for diagnosis, and blood cultures are positive in fewer than 5% of all cases.

It is important to evaluate for co-existent abscess, as this finding usually requires surgical drainage as opposed to antibiotic therapy alone. Physicians' clinical assessment for abscess may be limited, especially in cases with extensive overlying induration, but use of bedside ultrasonography performed by an experienced practitioner readily discriminates between abscess and cellulitis and may change management in up to 56% of cases. Use of ultrasound for abscess identification may also be indicated in cases of antibiotic failure.

Differential diagnosis:

1. Deep vein thrombosis (DVT).

2. Stasis dermatitis, which is inflammation of the skin from poor blood flow.

3. Necrotizing fasciitis or gas gangrene.

4. Lyme disease.

Treatment:

Antibiotics are usually prescribed, with the agent selected based on suspected organism and presence or absence of purulence, although the best treatment choice is unclear. If an abscess is also present, surgical drainage is usually indicated, with antibiotics often prescribed for co-existent cellulitis, especially if extensive. Pain relief is also often prescribed, but excessive pain should always be investigated, as it is a symptom of necrotizing fasciitis. Elevation of the affected area is often recommended. Steroids may speed recovery in those on antibiotics.

Antibiotics:

Is typically with antibiotics taken by mouth, such as cephalexin, amoxicillin or cloxacillin. Those who are seriously allergic to penicillin may be prescribed erythromycin or clindamycin instead.

When methicillin-resistant *S. aureus* (MRSA) is a concern, doxycycline or trimethoprim/sulfamethoxazole may, in addition, be recommended.

Complications:

Potential complications may include abscess formation, fasciitis, and sepsis.