ABC of Dermatology

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BACTERIAL INFECTION

Rubor—erythema
Tumor—swelling and oedema
Calor—heat or warmth
Dolor—pain and discomfort

The process of infection involves the interaction of two organisms—host and invader. The clinical changes are a manifestation of the resulting “battle of the cells” as so clearly perceived by Metchnikoff 100 years ago. The lesions produced may have a well recognised appearance, such as impetigo or tinea cruris, but are often less specific.

Several features enable us to recognise that infection is a possible cause of the patient's condition.

Acute bacterial infections produce the classical characteristics of acute inflammation described by Celsus (see box).

Presentation

19 March 1982.

23 March 1982.

This woman had acute erysipelas due to a haemolytic streptococcus, and all four features were present. She was, however, referred to the clinic with a diagnosis of acute allergy, which, from the appearance alone, was understandable. However, malaise and fever were also present and the lesions were warm. The condition responded well to antibiotic treatment. The point of entry in such cases may be a “spot” on the face or a small erosion near the nose, mouth, or ears. Erysipelas of the leg or foot may follow a small fissure between the toes.

Erysipelas is the local manifestation of a streptococcal infection, but this organism in the throat can result in the widespread rash of scarlet fever, which is rarely seen these days, or erythema multiforme, which is more common. An acute generalised vasculitis can also be associated with a streptococcal infection.

- (1) In any patient with a localised area of acute erythema, swelling, and raised temperature consider infection.
- (2) Remember that a *generalised* erythematous rash may be the manifestation of a *localised* infection. Scarlet fever arises from streptococcal throat infection, and herpes simplex of the lip may be associated with erythema multiforme.
- (3) The common pathogens are also commensals—recent studies showed that 60% of individuals are nasal carriers of *Staphylococcus aureus* intermittently and 10% carry *Streptococcus pyogenes* in the throat.

Common patterns of cutaneous bacterial infection

	<i>Infected eczema</i>	<i>Impetigo (non-bullous)</i>	<i>Impetigo (bullous)</i>
<i>Appearance</i>	<p>Exudate Crusts Inflammation</p>	<p>Transient vesicles Exuding lesions with yellow crusts Erythema Affects mainly face and limbs</p>	<p>Erythema and bullae which rupture to leave superficial crusts May be central clearing Affects face, buttocks, and limbs</p>
<i>Cause</i>	Persistent scratching Topical steroids	Local reaction between invading organisms and neutrophils, resulting in superficial epidermal split in bullous lesion	
<i>Organism</i>	<i>Staphylococcus aureus</i> <i>Streptococcus pyogenes</i>	<i>Staphylococcus aureus</i> <i>Streptococcus pyogenes</i> in some outbreaks	<i>Staphylococcus aureus</i>
<i>Treatment</i>	<ol style="list-style-type: none"> (1) Weaker topical steroids (for the eczema) with topical antibiotics (2) Systemic antibiotics if necessary (3) Soaks with potassium permanganate (4) 1% eosin or gentian violet to paint erosions 	Topical antibiotics Systemic antibiotics directed against both streptococcal and staphylococcal infection	Topical and systemic antibiotics

Notes

- Avoid prolonged use of topical antibiotics
- Return to using weaker steroid when infection has healed
- Even without clinical evidence of infection most lesions of atopic eczema are colonised by *Staphylococcus aureus*
- Staphylococcal infection can cause widespread superficial shedding of the epidermis—"scalded skin syndrome" (Lyell's disease)
- Always send a specimen for bacteriology: nephritogenic strains of streptococcus in impetigo are a common cause of acute glomerulonephritis

Boils (and furuncles) and carbuncles

Inflammatory nodule affecting the hair follicles develops into a pustule
Tender induration with considerable inflammation, followed by necrosis
Heals with scarring
More common in adolescents in winter
Several boils may coalesce to form a carbuncle

Possible anaemia and fatigue
Mechanical damage from clothing

Staphylococcus aureus, usually of same strain as in nose and perineum

- (1) Antibiotic (penicillinase resistant) systemically
- (2) Cleaning of skin with weak chlorhexidine solution or a similar preparation

Folliculitis

Various forms:

- (1) *Scalp*
Children—"Follicular impetigo"
Adults—
(a) Folliculitis cheloidalis
Back of neck
(b) Acne necrotica
Forehead/hairline
- (2) *Face*—"Sycosis barbae" in men with seborrhoea (greasy skin)
- (3) *Legs*—Chronic folliculitis

- (1) Underlying disease—eg diabetes
- (2) Infection may be precipitated by mechanical injury, tar pastes, and occlusive dressings

Staphylococcus aureus
Propionibacterium acnes
Pityrosporum spp
Pseudomonas spp and other Gram negative organisms

Topical and long term systemic antibiotics—eg oxytetracycline
Topical antifungal for pityrosporum infection

Ecthyma

Small bullae may be present initially
An adherent crust is followed by a purulent ulcerated lesion with surrounding erythema and induration, which slowly heals
Usually on legs

Minor injuries
More common in debilitated individuals

Both streptococcus and staphylococcus

Improve nutrition
Use antibiotic effective against both staphylococcus and streptococcus

Erysipelas

Well defined areas of erythema—very tender, not oedematous
Vesicles may form
Common sites—abdominal wall in infants; in adults the lower leg and face
An area of broken skin, forming a portal of entry, may be found

Lymphoedema and severe inflammation due to bacterial toxins

Streptococcus pyogenes (group A, but may be B, C, or G)
Staphylococcus aureus
Klebsiella pneumoniae
Haemophilus influenzae

Penicillin or erythromycin

- Nasal and perineal swabs should be taken to identify carriers
- Remember unusual causes—a bricklayer presented with a boil on the arm with necrosis due to anthrax (malignant pustule) acquired from the packing straw used for the bricks

- Gram negative folliculitis occurs on the face—a complication of long term treatment for acne
- A persistent, painful type of necrotic folliculitis occurs in those who wear hats, caps, or helmets for long periods

- Check for debilitating diseases, reticuloses, diabetes

- Cellulitis affects the deeper tissues and has more diverse causes, being essentially inflammation of the connective tissue
- Streptococcus, staphylococcus, haemophilus, and other organisms may be found
- Beware of erysipelas of the face—the venous drainage is deep to the cavernous sinus. A young resident physician decided to "tough out" her erysipelas on the cheek and refused treatment. Severe fever, facial oedema, and malaise associated with cavernous sinus phlebitis followed

Mycobacterial disease

Lupus vulgaris.

Swimming pool granuloma.

The clinical presentation of mycobacterial disease depends on the immune response of the host—hence the difference between disseminated miliary tuberculosis and lupus vulgaris or, for example, tuberculoid and lepromatous leprosy.

These infections are rarely seen in the West so only the most common types—lupus vulgaris and “atypical mycobacterial infection” are described.

Lupus vulgaris is a very slowly growing indolent condition of the skin. The lesion shown was 20 years old and may have been acquired from the cattle with which the man worked. The characteristic giant cell granuloma can be clearly seen.

Atypical mycobacterial infections—Although infection with *Mycobacterium tuberculosis* is now rare in Britain, other types of mycobacterial skin infection occur. The most common is “fishtank” or “swimming pool” granuloma, acquired from tropical fish tackle or swimming pools, respectively, and caused by *Mycobacterium marinum*. Nodular lesions develop slowly with ulceration but there is no regional lymph node enlargement. *Mycobacterium kansasii* infection is rare and *Mycobacterium ulcerans* confined to the tropics.

Erythema of the face

Acute

	Usually unilateral	Usually bilateral	Photosensitive
(1) Allergic reactions			
Cosmetics (<i>left</i>)		+	+ or -
Plants	+	or +	+ or -
Drugs		+	+ or -
(2) Reactions to light			
Photodermatitis (<i>right</i>)		+	+
Solar urticaria		+	+

(3) Lupus erythematosus			
Systemic (<i>left</i>)		+	+
(4) Infection			
Erysipelas (<i>right</i>)		+	-
Fifth disease (slapped cheek)		+	-

Chronic-recurrent

(5) Rosacea (<i>left</i>)		+	+ or -
(6) Lupus erythematosus			
Systemic		+	+
Discoid (<i>right</i>)	+	or +	+

(7) Seborrhoeic dermatitis (<i>left</i>)		+	-
(8) Acne		+	+
(9) Perioral dermatitis (<i>right</i>)		+	-

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