Acne

Andrews’ Chapter 13
David M. Bracciano, D.O.
Acne Vulgaris

- Chronic inflammatory disease of the pilosebaceous follicles
- Comedones, papules, pustules, cysts, nodules, and often scars
- Face, neck, upper trunk, and upper arms
• Disease of the adolescent
• 90% of all teenagers
• May also begin in twenties
• Usually involution by 25
• Occurs primarily in oily{seborrheic} areas of the skin
• Face occurs; cheeks> nose>forehead>chin
• Ears; comedones in concha, cysts in lobules
• Retroauricular and nuchal cysts
PATHWAYS OF C19 STEROID METABOLISM

DHEA → Androstenedione
  Aromatase
  Estrone
  Estradiol

Androstenedione → Testosterone
  17α-HSD
  Estradiol

Testosterone → Dihydrotestosterone (DHT)
  5α-reductase

Dihydrotestosterone (DHT) → Androstanediols
  3α- and 3β-HSDs

Comedo

- Commonly known as the *blackhead*
- Basic lesion of acne
- Produced by hyperkeratosis of the lining of the follicles
- Retention of keratin and sebum
Comedo

- Plugging produced by the comedo dilates the mouth of the follicle
- Papules are formed by inflammation around the comedones
Severity of Acne

- Typical mild acne; comedones predominate
- More severe cases; pustules and papules predominate, heal with scar if deep
- Acne Conglobata; suppurating cystic lesions predominate, and severe scarring results
Types

- Acne comedo; mild case were eruption is composed almost entirely of comedones on an oily skin
- Papular acne; inflammatory papules, most common in young men with coarse, oily skin
- Atrophic acne; residual atrophic pits and scars
Etiology

- Keratin plug in lower infundibulum of hair follicle
- Androgenic stimulation of sebaceous, proliferation of propionbacterium acnes which metabolizes sebum to produce free fatty acids
Pathogenesis

• Disruption of the follicular epithelium permits discharge of the follicular contents into the dermis
• Causes the formation of inflammatory papules, pustules, and nodulocystic lesions
• FFA are chemotactic to components of inflammation
Pathogenesis

• Effects of tetracycline are obtained by the reduction of FFA
• Antibiotics do not produce involution of the inflammatory lesions present, but inhibit the formation of new lesions
• Topical retinoic acid acts on keratinization, causing horny cells to lose their stickiness
Pathogenesis

- Androgens enlarge the sebaceous glands
- In women consider hyperandrogenic state
Histology

- Acne is characterized by perifollicular inflammation around comedones
- Exudate of lymphocytes and PMNs
- Plasma cells, foreign body giant cells, and proliferation of fibroblasts
- Large cysts and epithelial-lined sinus tracts
<table>
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<th>History and physical examination of the acne patient</th>
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<tbody>
<tr>
<td><strong>HISTORY AND PHYSICAL EXAMINATION OF THE ACNE PATIENT</strong></td>
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<tr>
<td>History</td>
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<tr>
<td>Sex</td>
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<td>Age</td>
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<td>Motivation</td>
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<tr>
<td>• Corticosteroids</td>
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<td>• Oral contraceptives</td>
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<td>• Anabolic steroids</td>
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<td>Concomitant illnesses</td>
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</tbody>
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### Differential Diagnosis of Acne

*D Can also lead to rosacea-like picture (see Chapter 39). †Early or small sized. §In the differential diagnosis of cystic lesions of the trunk.

#### Differential Diagnosis of Acne

<table>
<thead>
<tr>
<th>Acne vulgaris – comedonal</th>
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<tbody>
<tr>
<td>Closed</td>
</tr>
<tr>
<td>- Milia</td>
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<tr>
<td>- Osteoma cutis</td>
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<tr>
<td>- Sebaceous hyperplasia</td>
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<tr>
<td>- Trichoepitheliomas†</td>
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<tr>
<td>- Trichodiscomas</td>
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<tr>
<td>- Fibrofolliculomas</td>
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<tr>
<td>- Eruptive vellus hair cysts§, steatocystoma multiplex§</td>
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<tr>
<td>- Colloid milia</td>
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<tr>
<td>- Acne due to systemic corticosteroids* and anabolic steroids</td>
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<tr>
<td>- Contact acne</td>
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<tr>
<td>Open</td>
</tr>
<tr>
<td>- Contact acne</td>
</tr>
<tr>
<td>- Acne due to systemic corticosteroids and anabolic steroids</td>
</tr>
<tr>
<td>- Trichostasis spinulosa</td>
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<tr>
<td>- Dilated pore of Winer</td>
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<tr>
<td>- Favre–Rochochot</td>
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<tr>
<td>- Nevus comedonicus</td>
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<table>
<thead>
<tr>
<th>Acne vulgaris – inflammatory</th>
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<tbody>
<tr>
<td>- Rosacea</td>
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<tr>
<td>- Perioral dermatitis</td>
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<tr>
<td>- Lupus miliaris disseminata faciei</td>
</tr>
<tr>
<td>- Acne due to topical or systemic corticosteroids, or anabolic steroids</td>
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<tr>
<td>- Staphylococcal folliculitis</td>
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<tr>
<td>- Gram-negative folliculitis</td>
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<td>- Eosinophilic folliculitis</td>
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<tr>
<td>- Pseudofolliculitis barbae, acne keloidalis nuchae</td>
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<tr>
<td>- Furuncle/carbuncle</td>
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<tr>
<td>- Keratosis pilaris</td>
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<tr>
<td>- Neurotic excoriations/factitial</td>
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<table>
<thead>
<tr>
<th>Infantile acne</th>
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<tbody>
<tr>
<td>- Sebaceous hyperplasia</td>
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<tr>
<td>- Miliaria rubra</td>
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<tr>
<td>- Milia</td>
</tr>
<tr>
<td>- Candidal infections</td>
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Treatment

- Topical medications to systemic therapy
- No evidence that dietary habits influence acne
Antibacterials

- Tetracycline since 1951
- Safest and cheapest choice
- 250 to 500mg QD to QID
- Gradual reduction in dose
- Take on empty stomach
- Calcium and iron decrease absorption
- Constant or intermittent tx months to years
Tetracyclines

- Tetracyclines as sole treatment will give a positive response in 70%
- May take 4-6 weeks for response
- Vaginitis and perianal itching in 5% due to Candida albicans
- Staining of growing teeth precludes use in pregnancy and children < 9 or 10
Minocycline

- More effective than tetracycline in acne vulgaris
- 50 to 100mg QD or BID
- Absorption less affected by milk and food
Antibacterials

- Doxycyline; P. ances resistant to erythromycin, photosensitivity can occur
- Erythromycin; consider in young and pregnant who cannot use tetracycline
- Clindamycin; works well, but can cause pseudomembranous colitis
- Sulfanomides; phototoxicity, Scalded skin
Bacterial Resistance

• Worsening clinical condition correlates with a high MIC for erythromycin and tetracycline for P. acnes

• Resistance lost after 2 months after withdrawal of antibiotic

• Avoid use of different oral and topical antibiotics at the same time
Oral Contraceptives

- Estradiol suppresses the uptake of testosterone by the sebaceous glands
- Oral contraceptives containing androgenic progesterones may exacerbate acne
- EES and Norgestimate is approved for tx
- (Ortho Tri-cyclen, Estrostep, Yazmine)
Hormonal Therapy

- Spironolactone 25mg to 300mg/d, antiandrogenic
- Steroids for severe inflammatory acne
Isotretinoin

- 0.5 to 1 mg/kg/day qd or bid for 15 to 20 weeks
- Leads to a remission that may last months to years
- teratogenic
Isotretinoin

- Retinoids exert their physiologic effects through two distinct families of nuclear receptors
- RARs and retinoid X receptors (RXRs)
- Affects sebum production, comedongenesis, P. acne, keritization, not related to RAR and RXR affinity
Isotretinoin

- Hypertriglyceridemia, dry mucosa
- Nasal colonization with S. aureus in 90%
- Worsening of acne common in first month
- Monitor HCG, lipids, lfts
Topical Treatment

- Benzoyl peroxide
- Topical retinoids
- Topical antibacterials
- Salicylic acid, Azeleic acid
Benzoyl Peroxide

- Available as gels, lotions, washes and bars
- 2.5% to 10%
- Potent antibacterial effect
- May decrease antibacterial resistance
- Decrease frequency of application if irritation occurs
Table 38.4  Topical retinoid preparations used for acne vulgaris. Preparations that are currently available.

<table>
<thead>
<tr>
<th>Drug</th>
<th>Vehicle</th>
<th>Concentration (%)</th>
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<tbody>
<tr>
<td>Tretinoin</td>
<td>Cream</td>
<td>0.025, 0.05, 0.1</td>
</tr>
<tr>
<td></td>
<td>Gel</td>
<td>0.01, 0.025</td>
</tr>
<tr>
<td></td>
<td>Solution</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>Gel with microsponge system</td>
<td>0.05</td>
</tr>
<tr>
<td>Adapalene</td>
<td>Cream</td>
<td>0.1</td>
</tr>
<tr>
<td></td>
<td>Gel</td>
<td>0.1</td>
</tr>
<tr>
<td></td>
<td>Solution</td>
<td>0.1</td>
</tr>
<tr>
<td>Tazarotene</td>
<td>Gel</td>
<td>0.05, 0.1</td>
</tr>
<tr>
<td></td>
<td>Cream</td>
<td>0.05, 0.1</td>
</tr>
</tbody>
</table>
Topical Retinoids

- Creams, gels, liquids
- 0.01%, 0.025%, 0.04%, 0.05% and 0.1%
- Cream base may be less irritating
- Affect follicular keratinization
- Comedolytic
- Apply qhs, may take 8 to 12 weeks
Topical Antibacterials

- Clindamycin 1% effective against pustules and small papulopustular lesions
- Erythromycin 3%
- Both equally effective, combined with bezoyl peroxide can decrease resistance
Other Topicals

- Azeleic Acid; low adverse reactions
- Salicylic acid
- Abrasive cleaners, astringents make the skin dry and susceptible to irritants
Surgical Treatment

• Comedone extractor brings about quick resolution of comedones and pustules
• In Isotretinoin pts macrocomedones present at week 10 to 15 of therapy
Intralesional Corticosteroids

- Effective in reducing inflammatory papules, pustules, and smaller cysts
- Kenalog-10 (triamcinolone 10mg/ml)
- Diluted with NS to 5 or 2.5mg/ml
Complications of Acne

- Scarring can occur despite best treatment
- Pitted scars, wide-mouthed depressions and keloids
- Chemical peels, CO2 Laser resurfacing, scar excision,
APPROACH TO PATIENT WITH TREATMENT-RESISTANT ACNE VULGARIS

1. Treatment-resistant acne vulgaris
   - Women
     - Exclude adrenal or ovarian dysfunction
   - Exclude-gram-negative folliculitis
   - Review all topical and oral medications, supplements, etc.
Table 38.3  Common therapies for acne vulgaris. 1, Double-blind study; 2, clinical series; 3, anecdotal.

<table>
<thead>
<tr>
<th>Topical therapy</th>
<th>Systemic therapy</th>
</tr>
</thead>
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<tr>
<td>Benzoyl peroxide (1)</td>
<td>Oral contraceptives (1)</td>
</tr>
<tr>
<td>Antibiotics (1)</td>
<td>Oral spironolactone (1)</td>
</tr>
<tr>
<td>Retinoids (1)</td>
<td>Oral minocycline (1)</td>
</tr>
<tr>
<td>Salicylic acid (2)</td>
<td>Oral erythromycin</td>
</tr>
<tr>
<td>Azelaic acid (2)</td>
<td>Tetracycline</td>
</tr>
</tbody>
</table>

Acne Conglobata

- Conglobate: shaped in a rounded mass or ball
- Severe form of acne characterized by numerous comedones, large abscesses with sinuses, grouped inflammatory nodules
- Suppuration
- Cysts on forehead, cheeks, and neck
Acne Conglobata

- Occurs most frequently in young men
- Follicular Occlusion Triad: acne conglobata, hiradenitis suppurva, cellulitis of the scalp
- Heals with scarring
- Treatment; oral isotretinoin for 5 months
Acne Fulminans

- Rare form of extremely severe cystic acne
- Teenage boys, chest and back
- Rapid degeneration of nodules leaving ulceration
- Fever, leukocytosis, arthralgias are common
- Tx; oral steroids, isotretinoin
SAPHO Syndrome

- Synovitis, Acne, Pustulosis, Hyperostosis, and Osteomyelitis
- Acne fulminans, acne conglobata, pustular psoriasis, and palmoplantar pustulosis
- Chest wall is most site of musculoskeletal complaints
Tropical Acne

- Nodular, cystic, and pustular lesions on back, buttocks, and thighs
- Face is spared
- Young adult military stationed in tropics
Premenstrual Acne

- Papulopustular lesions week prior
- Estrogen-dominant contraceptive pills will diminish
Preadolescent Acne

• Neonatal
• Infantile
• Childhood
Neonatal Acne

- First four weeks of life
- Develops a few days after birth
- Facial papules or pustules
Infantile Acne

- Cases that persist beyond 4 weeks or have an onset after
- R/O acne cosmetic, acne venenata, drug-induced acne
Acne Venenata

• Contact with acnegenic chemicals can produce comedones
• Chlorinated hydrocarbons, cutting oils, petroleum oil, coal tar
• Radiation therapy
Acne Cosmetica

- Closed comedones and papulopustules on the chin and cheeks
- May take months to clear after stopping cosmetic product
- Pomade Acne; blacks, males, due to greases or oils applied to hair
Acne Detergicans

- Patients wash face with comedogenic soaps
- Closed comedones
- TX: wash only once or twice a day with non-comedogenic soap
Acne Aestivalis

- Aka; Mallorca acne
- Rare, females 25-40 yrs
- Starts in spring, resolves by fall
- Small papules on cheeks, neck, upper body
- Comedones and pustules are sparse or absent
- Tx; retinoic acid, abx don’t help
Excoriated Acne

• Aka; picker’s acne
• Girls, minute or trivial primary lesions are made worse by squeezing
• Crusts, scarring, and atrophy
• TX; eliminate magnifying mirror, r/o depression
Acneiform Eruptions

- Originate from skin exposure to various industrial chemicals
- Papules and pustules not confined to usual sites of acne vulgaris
- Chlorinated hydrocarbons, oils, coal tar
- Oral meds; iodides, bromides, lithium, steroids (steroid acne)
Gram Negative Folliculitis

• Occurs in patients treated with antibiotics for acne over a long-term
• *Enterobactor, Klebsiella, Proteus*
• Anterior nares colonized
• Tx; isotretinoin, Augmentin
Acne Keloidalis

• Folliculitis of the deep levels of the hair follicle that progresses into a perifolliculitis
• Occurs at nuchal area in blacks or Asian men
• Not associated with acne vulgaris
• Hypertrophic connective tissue becomes sclerotic, free hairs trapped in the dermis contribute to inflammation
• Tx; intralesional Kenalog, surgery
Hiradenitis Suppurativa

- Disease of the apocrine gland
- Axillae, groin, buttocks, also areola
- Obesity and genetic tendency to acne
- Tender red nodules become fluctuant and painful
- Rupture, suppuration, formation of sinus tracts
Hiradenitis Suppurativa

- Most frequently axillae of young women
- Men usually groin and perianal area
- Follicular keratinization with plugging of the apocrine duct; dilation and inflammation
- Ddx: Furuncles are unilateral, and not associated with comedones, Bartholin cyst, scrofuloderma, actinomycosis, granuloma inguinale
Hiradenitis Suppurativa

- Oral antibiotics, culture S. aureus, gram-negatives
- Intralesional steroids, surgery
- Isotretinoin helpful in some cases
Perifolliculitis Capitis Abscedens

- Aka; *Dissecting cellulitis of the scalp*
- Uncommon suppurative disease
- Nodules suppurate and undermine to form sinuses
- Scarring and alopecia
- Adult black men most common, vertex and occiput
Perifolliculitis Capitis Abscedens

- Tx; intralesional steroids, isotretinoin, oral abx, surgical incision and drainage
Acne vs. Rosacea
Rosacea

- Chronic inflammatory eruption of the flush areas of the face
- Erythema, papules, pustules, telangiectasia, hypertrophy of the sebaceous glands
- Usually mid-face
- Women ages 30-50
Ocular Rosacea

- Blepharitis, conjunctivitis
- Keratitis, iritis, episcleritis
- C/o gritty, stinging sensation
Ocular rosacea occurs in about 58% of rosacea patients.
Chronically inflamed eyelid margins may be confused with seborrheic dermatitis
Granulomatous Rosacea

• Midface, perioral, lateral mandible areas
• Noncaseating granulomas
Rosacea Etiology

- Vasomotor liability
- Hot liquids, ETOH, steroids (oral and topical) i.e.: perioral dermatitis
- *Demodex folliculorum* not causative
Differential Diagnosis Rosacea

• Acne Vulgaris
• Lupus erythematosus
• Bromoderma, ioderma
• Papular syphilid
Inflammatory rosacea

• Papules and pustules are characteristic
Rosacea Treatment

- Long-term oral tetracycline is suppressive, required for ocular rosacea
- Topical metronidazole
- Sunscreens, avoidance of flushing triggers
- Flash lamped pumped dye laser for telangectasias
Rosacea
Rhinophyma
Rhinophyma

- Men over 40
- Pilosebaceous gland hyperplasia with fibrosis, inflammation, and telangiectasia
- Treatment is surgery
Pyoderma Faciale

- Postadolescent girls, reddish cyanotic erythema with abscesses and cysts
- Distinguished from acne by absence of comedones, rapid onset, fulminant course and absence of acne on the back and chest
- Tx; oral steroids followed by isotretinoin
Perioral Dermatitis

- Papulosquamous eruption
- Clear zone around vermillion border
- Women 23-35yrs
- Etiology; ?topical steroids, fluorinated toothpaste
- Tx; d/c topical steroids, oral tcn if pustules