Arthropod overview

Arthropods Overview

General Characteristics

Arthropods are **ancient, highly diverse organisms** with the following features:

- **Segmented bodies**
- **Paired, jointed appendages** *(legs and antennae)*
- **Exoskeleton**
- **Bilateral symmetry**

Life Cycle

- Growth occurs via **molting** through stages:
  - Egg
  - Larva or nymph
  - Adult
- Represent the **most diverse phylum**, with most species in:
  - **Class Insecta**

Classification

1. Mandibulates (with antennae)

- Insects
- Chilopoda *(centipedes)*
- Diplopoda *(millipedes)*

2. Chelicerates (without antennae)

- Scorpions
- Spiders
- Mites

Pathophysiology

1. Mechanical Trauma

- Occurs due to:
    - **Puncture or laceration** during skin penetration
- Depends on **mouthparts**

Blood-feeding Types

- **Vessel feeders:**
    - Mosquitoes
    - Lice
      ? Direct capillary feeding
- **Pool feeders:**
    - Stable flies
      ? Tear skin and feed on pooled blood

2. Injection of Substances

- Injected during feeding or stinging:
    - Irritants

- Cytotoxic agents
- Pharmacologically active substances *(histamine, enzymes)*

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3. Injection of Allergens

- Host immune response to:
  - Salivary proteins
  - Venom antigens
- Leads to:
  - **Papular hypersensitivity**
  - **Systemic allergic reactions**

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4. Secondary Infection

- Due to:
  - Scratching
  - Direct inoculation of bacteria

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5. Tissue Invasion

- Certain arthropods (e.g., flies) cause:

- **Myiasis** *(larval invasion of tissues)*

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6. Contact Reactions

- Caused by:
  - Secretions
  - Body fragments
- May be:
  - Irritant
  - Allergic

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7. Reactions to Retained Mouthparts

- Example:
  - Tick bites
- Can lead to:
  - **Granulomatous inflammation**

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8. Transmission of Diseases

- Arthropods act as **vectors** for major diseases:

- **Mosquitoes ? Malaria**
- **Lice ? Typhus**
- **Sandflies ? Leishmaniasis**

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9. Environmental and Social Factors

- Exposure influenced by:
    - Habitat
    - Clothing
    - Occupation
    - Animal contact
- Increased risk with:
    - **Overcrowding**
    - **Poor housing conditions**

Clinical Features

- Spectrum ranges from:
    - **Asymptomatic bites**
    - **Pruritic papules**
    - **Urticarial wheals**

- Severe reactions:
    - Bullous lesions
    - Localized necrosis
    - Systemic hypersensitivity

Investigations

- Based on **identification of arthropod source**

Methods

- Examination of:
  - Skin lesions
  - Environment
- Collection of specimens from:
  - Animals
  - Bedding
  - Household surroundings

Management

1. Prevention

- **Insect repellents:**
  - DEET
  - Citronella

- **Protective measures:**
    - Protective clothing
    - Insecticide-treated nets

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2. Treatment

- **Local care:**
    - Wound cleaning
    - Removal of retained parts
- **Medications:**
    - Topical corticosteroids
    - Antihistamines
    - Systemic therapy (if severe)
- **Antibiotics:**
    - For secondary infection
- **Specific therapy:**
    - **Antivenom** (if envenomation)
    - **Tetanus prophylaxis** when indicated

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3. Supportive Measures

- **Pain relief:**
  - Ice packs
  - Analgesics
- **Allergy management:**
  - Desensitization therapy *(in selected cases)*

Key Takeaways

? Arthropods are **diverse organisms** with medical importance
? Cause disease via **bites, stings, allergens, and infection transmission**
? Reactions range from **mild papules to severe systemic responses**
? Prevention (repellents, nets) is **crucial**
? Treatment includes **symptomatic care, antibiotics, and antivenom when needed**

Arthropod-Related Skin Disorders – Clinical Features, Investigations, and Management

Clinical Features

Local Reactions

- **At the bite/sting site:**
    - Redness
    - Swelling
    - Pain
- **Skin lesions:**
    - Papules
    - Wheals
    - Vesicles
    - Bullae
- Varies depending on:
    - Type of arthropod
    - Host immune response

Systemic Reactions

- **Allergic manifestations:**
  - Urticaria
  - Angioedema
  - Anaphylaxis *(severe cases)*
- **Vector-borne disease features:**
  - Fever
  - Rash
  - Organ-specific symptoms

Chronic Manifestations

- Persistent:
  - Pruritus
  - Granulomas
  - Ulcers
  - Necrotic lesions
- **Secondary bacterial infection:**

- Cellulitis
- Abscess formation

Special Features (Arthropod-Specific)

Ticks

- Local pruritus
- Retained mouthparts
- **Erythema migrans** *(Lyme disease)*

Mites

- Burrows
- **Intense itching** *(scabies)*

Flies

- **Myiasis:**
  - Larval invasion of tissues

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Investigations

1. History and Clinical Examination

- Identify:
    - Arthropod exposure
    - Environmental risk factors
    - Symptom pattern

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2. Specimen Collection

- Examine:
    - Arthropods or fragments from:
        - Skin
        - Clothing
        - Bedding
        - Surroundings

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3. Histopathology

- Skin biopsy may show:
    - Arthropod parts
    - Characteristic inflammatory patterns

4. Microbiological Tests

- Culture:
    - Detect **secondary bacterial infection**

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5. Serological Tests

- For **vector-borne diseases**:
    - Lyme disease
    - Malaria

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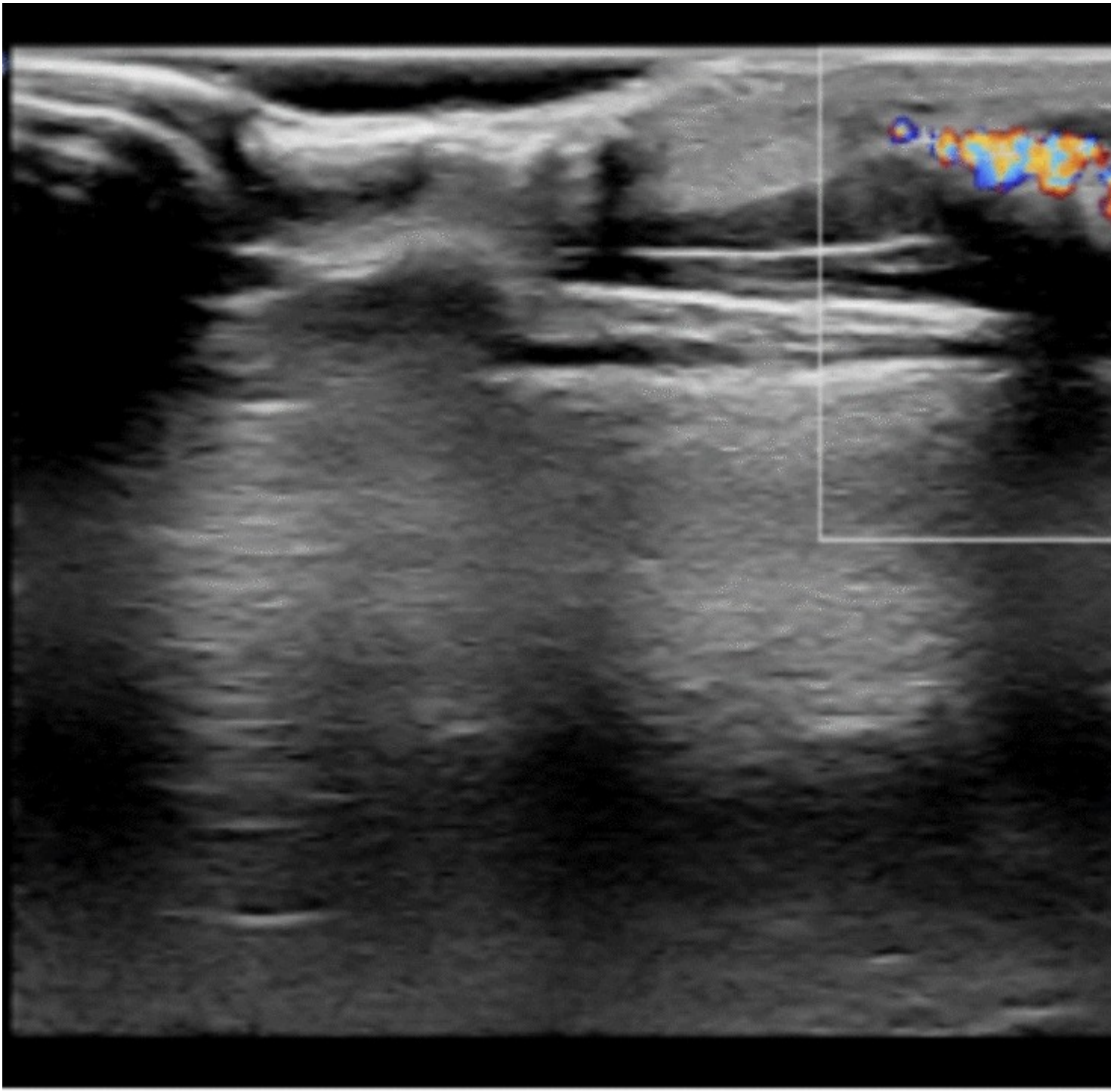
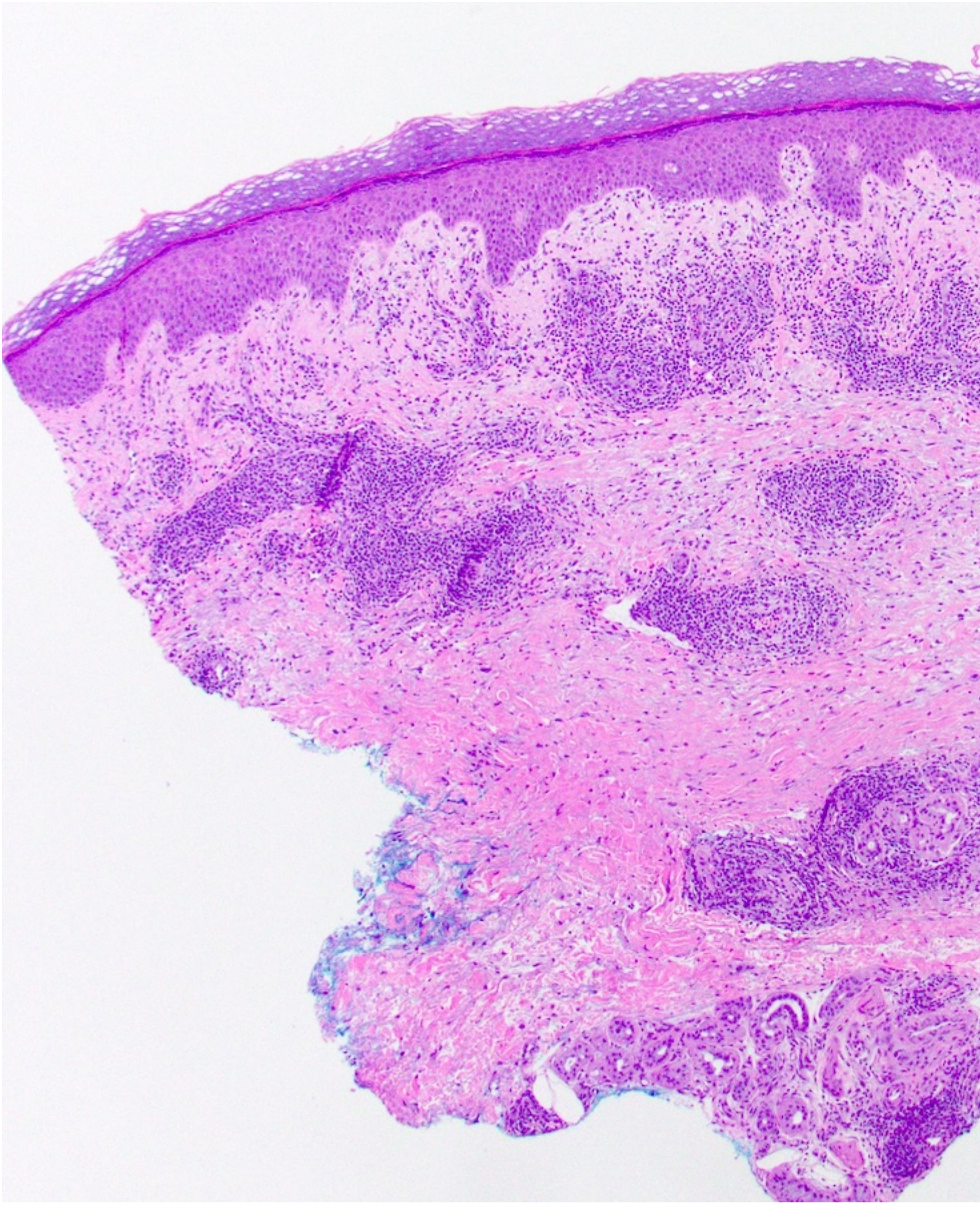
6. Imaging

- Useful in:
    - **Myiasis**
    - To locate larvae within tissues





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Management

General Management

1. Wound Care

- Clean with:
    - Antiseptics
- Remove:
    - Retained mouthparts
    - Arthropod remnants

2. Symptomatic Relief

- **Cold compresses** ? reduce swelling
- **Antihistamines** ? relieve pruritus
- **Corticosteroids:**
    - Topical (mild–moderate)
    - Systemic (severe cases)

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3. Treatment of Secondary Infection

- **Topical or oral antibiotics**
- For:
    - Cellulitis
    - Abscess

Specific Treatment

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1. Envenomation

- **Antivenom**:
    - Severe snake or spider bites

2. Larval Removal (Myiasis)

- **Manual extraction**
- **Occlusion techniques:**
  - Petroleum jelly
  - Topical agents
    ? Suffocate larvae before removal

3. Treatment of Vector-Borne Diseases

- Based on causative organism:
  - Antimalarials
  - Antibiotics
  - Antivirals

Prevention

Insect Repellents

1. Chemical Repellents

- **DEET (N,N-diethyl-meta-toluamide)**

- **Picaridin**
- **IR3535**

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2. Natural Repellents

- Citronella oil
- Eucalyptus oil
- Neem oil *(less effective)*

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3. Usage Guidelines

- Apply to:
  - Exposed skin
  - Clothing
- Avoid:
  - Damaged skin
  - Eyes and mouth

General Prevention

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1. Protective Measures

- Wear:

- Long sleeves
- Full-length clothing

- Use:
  - **Insecticide-treated nets** *(especially in malaria-endemic areas)*

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2. Environmental Control

- Eliminate:
  - Standing water *(mosquito breeding)*
- Maintain:
  - Clean surroundings
  - Use of pesticides

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3. Public Awareness

- Education on:
  - Arthropod risks
  - Preventive strategies

Key Takeaways

? Arthropod reactions range from **local papules to systemic anaphylaxis**
? Chronic cases may lead to **granulomas, ulcers, or infections**
? Diagnosis relies on **history + identification of arthropod source**
? Management includes **symptomatic care, infection control, and specific therapy**
? Prevention (repellents, clothing, environmental control) is **essential**