



Periodontology-451per- fourth stage



Second semester-Prevention of periodontal disease

Chemical plaque control Lec-14-part2

By assistant lecturer: Reham Adnan Radhi
Department of Periodontology
College of dentistry
University of Basrah

Introduction

- **An anti-infective agent** is a *chemotherapeutic agent* that acts by reducing the number of bacteria present.
- **An antibiotic** is a naturally occurring, semisynthetic, or synthetic type of anti-infective agent that destroys or inhibits the growth of select microorganisms, generally at low concentrations.
- **An antiseptic** is a chemical antimicrobial agent that can be applied topically or subgingivally to mucous membranes, wounds, or intact dermal surfaces to destroy microorganisms and inhibit their reproduction or metabolism.
- **Disinfectants** (a subcategory of antiseptics) are antimicrobial agents that are generally applied to inanimate surfaces to destroy microorganisms.

Anti-microbial agents

- The use of systemic antimicrobials in the management of periodontal disease should be restricted to the following conditions:
 1. Sever necrotizing ulcerative gingivitis.
 2. Multiple or sever periodontal abscesses with involvement of regional lymph nodes.
 3. Some cases of aggressive periodontitis.
 4. Refractory periodontitis.



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Periodontal abscess



Aggressive periodontitis

Routes of Administration

- 1) Systemic administration of antibiotics
- 2) Local administration of antibiotics

❖ Systemic Administration of Antibiotics

- ✓ Tetracycline, Minocycline, Doxycycline
- ✓ Metronidazole
- ✓ Penicillins
- ✓ Cephalosporins
- ✓ Clindamycin
- ✓ Ciprofloxacin
- ✓ Macrolides

✓ Tetracycline

- Effective against a broad spectrum of microorganisms; used systemically and applied locally (subgingivally).
- Used widely in periodontal disease treatment.
- Used frequently in treatment of refractory periodontitis and LAP.
- Bacteriostatic Effective against rapidly multiplying bacteria .
- 250mg 4 times daily.



❖ **Tetracycline effective in treating periodontal disease because:**

1. Their concentration in GCF is 2 to 10 times more than blood serum.
2. Ability to concentrate in POCKET.
3. Inhibit the growth of AA.
4. Have anti collagenase effect inhibiting tissue destruction.
5. Increase bone regeneration.

Side effects

- Gastrointestinal disturbances
- Photosensitivity
- Hypersensitivity
- Blood dyscrasias, dizziness, and headache.
- Tooth discoloration occurs when this drug is administered to children who are 12 years old or younger.

✓ Minocycline

- Effective against broad spectrum microorganisms.
- Administered 200 mg/ day for 1 week



✓ Doxycycline

- Has the same spectrum as minocycline and given once daily.

Dosage

- 100 mg twice daily the first day, which is then reduced to 100 mg daily. To reduce gastrointestinal upset, 50 mg can be taken twice daily after the initial dose.
- When given as a sub-antimicrobial dose (to inhibit collagenase), 20 mg of doxycycline twice daily is recommended.



✓ Metronidazole

- Metronidazole is a compound that was developed to treat protozoal infections.
- Bactericidal to anaerobic organisms because it disrupts the bacterial DNA.
- Effective against *Porphyromonas gingivalis* and *Prevotella intermedia* but not drug of choice against A.A unless combined to other antibiotics.

▪ Clinical Uses

1. Refractory periodontitis.
2. Necrotizing ulcerative gingivitis.
3. Chronic periodontitis.
4. Aggressive periodontitis.

▪ Dosage

- ✓ 250mg 3 times daily for a week.



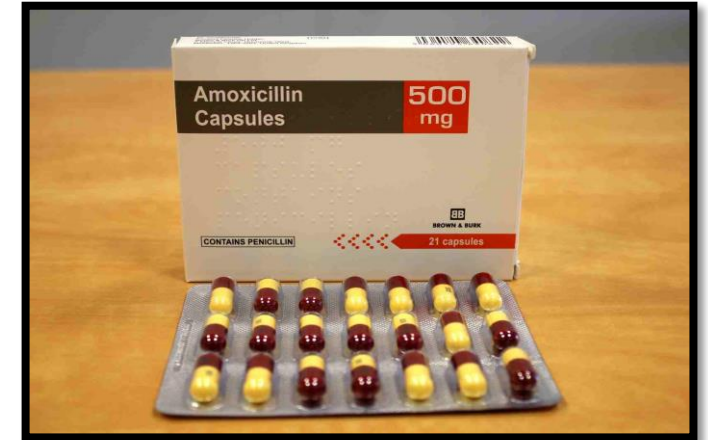
Side Effects

1. Antabuse effect when alcohol is ingested (severe cramp, nausea, vomiting).
2. Inhibit warfarin metabolism.
3. Patient undergoing anti coagulant therapy should avoid metronidazole because it prolongs prothrombin time.
4. metallic taste in mouth.

✓ Amoxicillin

Used for treatment of aggressive periodontitis both localized and generalized forms.

- The recommended dosage is 500 mg 3 times daily for 8 days.



✓ Amoxicillin–Clavulanate Potassium

- The combination of amoxicillin with clavulanate potassium makes this anti-infective agent resistant to penicillinase enzymes produced by some bacteria.
- Amoxicillin with clavulanate (Augmentin) may be useful for the management of patients with LAP or refractory periodontitis.



✓ Clindamycin

- Clindamycin is effective against anaerobic bacteria and has a strong affinity for osseous tissue. It is effective for situations in which the patient is allergic to penicillin
- Clindamycin 300 mg three times daily 10 days



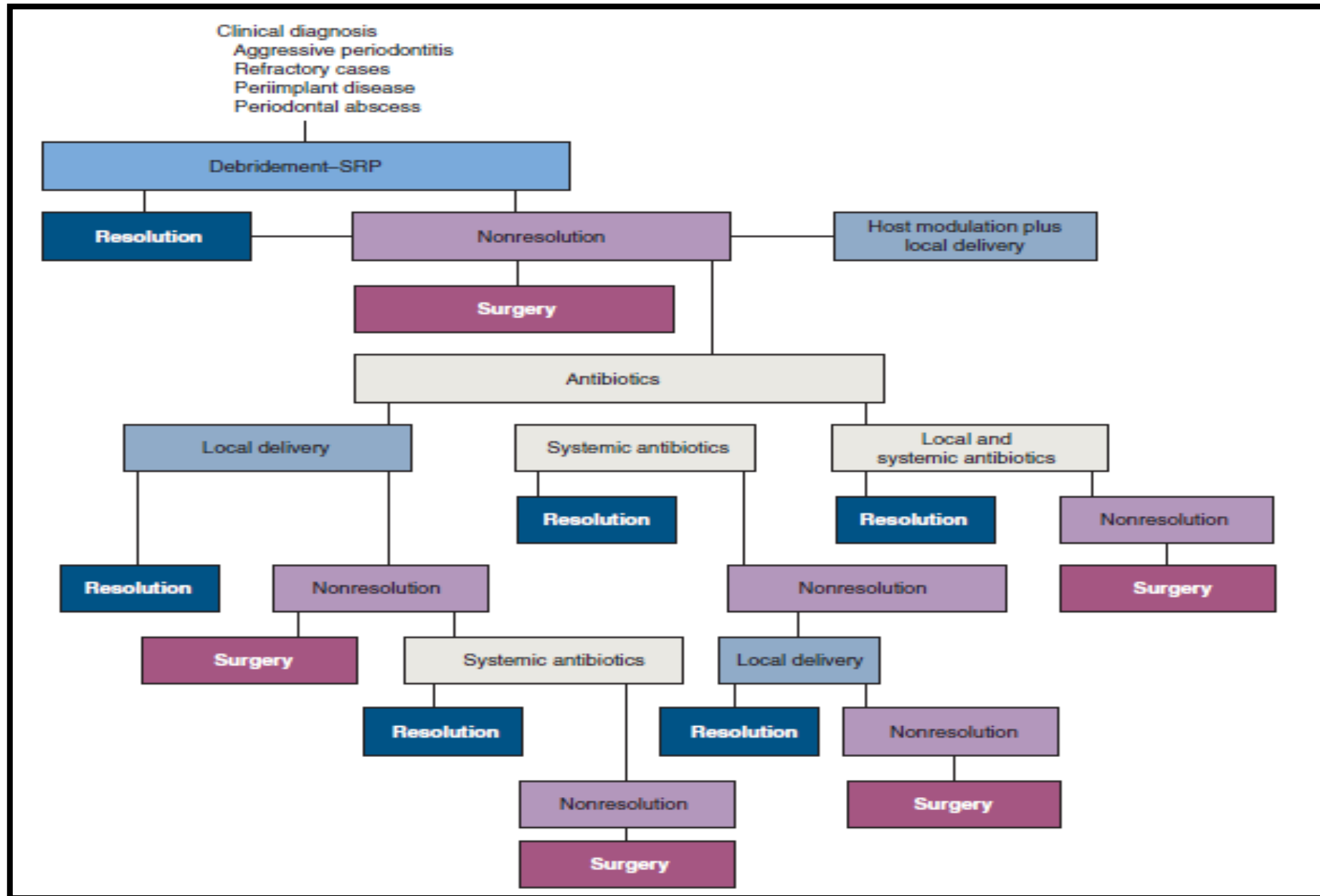
Serial and combination antibiotic therapy

1. **Amoxicillin + Clavulanate potassium (Augmentin)**
(resistance to penicillinase enzymes produced by some bacteria).
2. **Metronidazole + Augmentin or Amoxicillin:** provide excellent elimination of many organisms in adult and LAP.
3. **Metronidazole+ Ciprofloxacin :**effective against mixed infections

Common Antibiotic Regimens Used to Treat Periodontal Diseases

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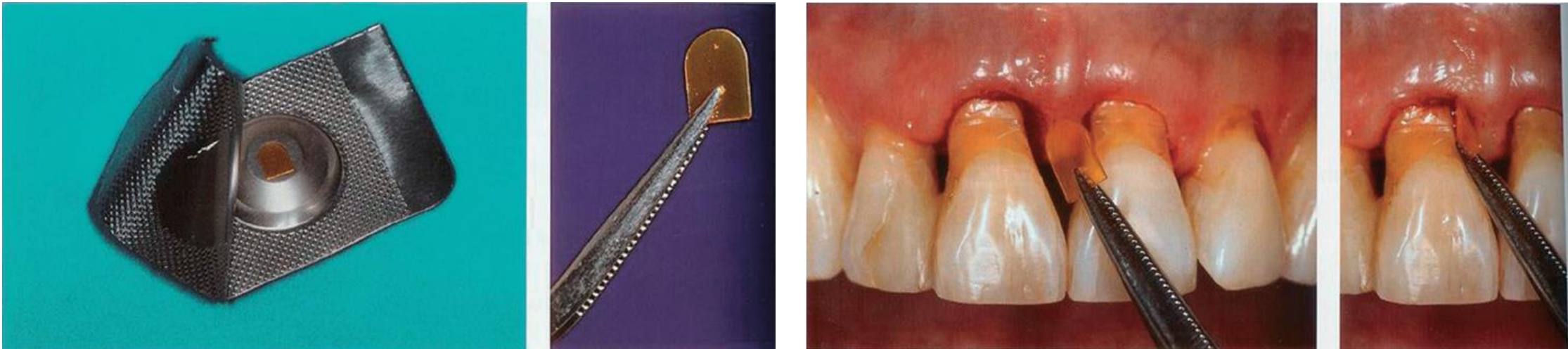
	Regimen	Dosage/Duration
Single Agent		
Amoxicillin	500 mg	Three times daily for 8 days
Azithromycin	500 mg	Once daily for 4 to 7 days
Ciprofloxacin	500 mg	Twice daily for 8 days
Clindamycin	300 mg	Three times daily 10 days
Doxycycline or minocycline	100 mg to 200 mg	Once daily for 21 days
Metronidazole	500 mg	Three times daily for 8 days
Combination Therapy		
Metronidazole + amoxicillin	250 mg of each	Three times daily for 8 days
Metronidazole + ciprofloxacin	500 mg of each	Twice daily for 8 days



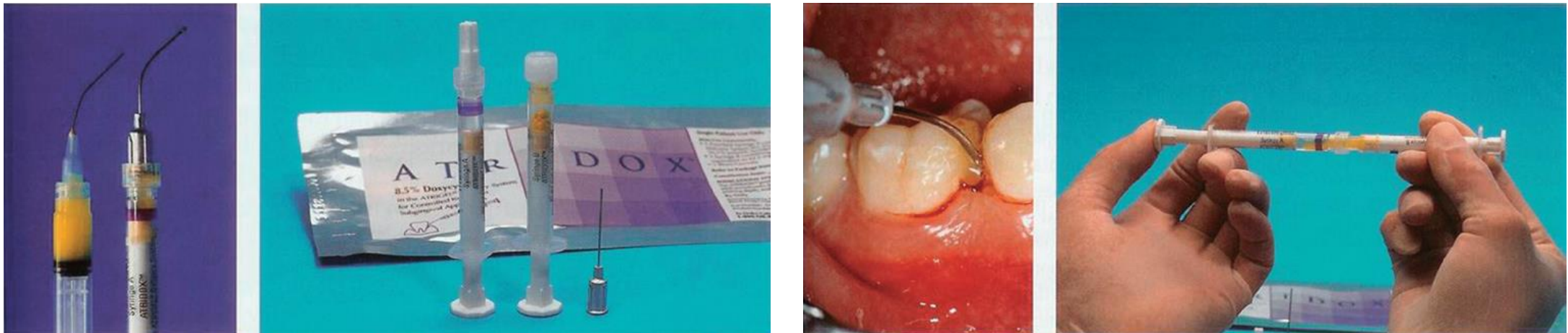
Locally Delivered, Controlled-Release Antimicrobials

- Chlorhexidine-containing chip (**PerioChip**)
- Doxycycline gel (**Atridox**)
- Minocycline microspheres (**Arestin**)

- ✓ **Chlorhexidine chip:** The chlorhexidine chip is indicated as an adjunct to SRP procedures for the reduction of pocket depth in adults with periodontitis
 - After placement in the pocket, the chip has been reported to release chlorhexidine into the gingival crevicular fluid (GCF) over 7 to 10 days.



- ✓ **Doxycycline gel:** Doxycycline gel is indicated for the treatment of chronic adult periodontitis for a gain in clinical attachment, reduction in probing depth, and reduction of bleeding on probing.
- The gel has been reported to release doxycycline in the GCF over 7 days. The doxycycline gel is biodegradable and does not require removal.



- ✓ **Minocycline microspheres** are indicated as an adjunct to SRP for the reduction of pocket depth in patients with adult periodontitis and as part of a periodontal maintenance program, which includes good oral hygiene and SRP.
- Patients should avoid hard or sticky foods at the treated teeth for 1 week and interproximal cleaning devices for about 10 days.



Minocycline hydrochloride microspheres (Arestin)

Antimicrobial agent	Product name	nature	Dosage form
Doxycycline	Atridox	Biodegradable	Mixture in syringe
Tetracycline	Actisite	Nonresorable	Fibers
Metronidazole	Elyzol	Biodegradable	Mixture in syringe
Minocycline	Arestin Dentamycin Periocline	Biodegradable	Mixture in syringe
Chlorhexidine	Periochip	Biodegradable	Chip device

Bibliography

- Jan Lindhe, Textbook of clinical periodontology and implant dentistry-6th ed.
- F.A Carranza, Textbook of clinical periodontology-12th ed.

Thank
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