Topic : Amyloidosis
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1. Definition:
Amyloidosis is a group of diseases caused by extracellular deposition of misfolded protein fibrils (amyloid), leading to organ dysfunction and tissue damage.

2. Types of Amyloid Proteins:
AL (Amyloid Light chain): Derived from immunoglobulin light chains; linked to plasma cell disorders (e.g., multiple myeloma).
AA (Amyloid A): Derived from serum amyloid A protein; associated with chronic inflammation.
Aβ: Derived from amyloid precursor protein; seen in Alzheimer's disease.
Others include TTR, β2-microglobulin, and prion proteins.

3. Pathogenesis:
Amyloidosis arises when misfolded proteins escape degradation and aggregate into insoluble fibrils. These deposits accumulate extracellularly and impair organ function.

4. Classification:
Primary (AL) Amyloidosis – associated with plasma cell disorders.
Secondary (AA) Amyloidosis – due to chronic inflammatory diseases (e.g., RA, IBD, chronic infections).
Hemodialysis-related – from β2-microglobulin.
Hereditary – due to mutant TTR (e.g., Familial Mediterranean Fever, Familial Amyloid Polyneuropathy).
Localized & Senile forms – confined to specific organs (e.g., heart, tongue, bladder).

5. Organs Commonly Affected:
Kidneys: proteinuria, nephrotic syndrome.
Heart: restrictive cardiomyopathy, arrhythmias.
Liver/Spleen: hepatosplenomegaly.
Tongue: macroglossia.
Nerves, GI, joints also frequently involved.

6. Microscopy & Staining:
H&E: Amyloid appears eosinophilic and hyaline.
Congo red: Classic red staining with apple-green birefringence under polarized light.
Thioflavin T/S: Fluorescent stains for amyloid.
Metachromatic stains: e.g., methyl/crystal violet (rose-pink).

7. Diagnosis:
Tissue biopsy (e.g., fat pad, rectal, kidney, liver).

Immunohistochemistry and immunofluorescence for typing.
Scans: Tc-99m or SAP scintigraphy.

8. Clinical Features:
Non-specific: weight loss, fatigue.
Organ-specific: renal failure, cardiac arrhythmia, GI issues, bleeding (due to vessel fragility).

9. Lab Findings:
M band on electrophoresis, Bence Jones proteins, ↑ BNP, ↑ troponin T, ↓ creatinine clearance.
ECG: low voltage QRS, arrhythmias.

10. Prognosis:
AL amyloidosis: poor prognosis (~2 years median survival).
AA amyloidosis: better prognosis, depends on control of underlying disease.