Polymyalgia Rheumatica and Giant Cell Arteritis: From Etymology to a Clinical Understanding

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University of Pittsburgh School of Medicine
Sir William Osler, the "Father of Modern Medicine," once said, "When an arthritis patient walks in the front door, I feel like leaving by the back door."
Adults Aged 18 and Older with Arthritis,* by Age and Sex, 2008–2010

*Reported a health professional has ever told them they have arthritis; total estimates are age-adjusted.

Source: Centers for Disease Control and Prevention, National Center for Health Statistics, National Health Interview Survey with multiply imputed poverty data, 2008-2010. Analysis conducted by the Maternal and Child Health Bureau.
Two clinical scenarios

* Bilateral Shoulder Pain

* Temporal headache
Goals

* Review the clinical manifestations and an evidence based approach to diagnosis, pathophysiology, and management of polymyalgia rheumatica and giant cell arteritis.

* Consider if PMR and GCA are separate entities or are they related.
**PMR & GCA overview**

* PMR and GCA are related inflammatory conditions of unknown etiology that usually begin after age 50.
* They either represent different manifestations of one disease or may be overlapping conditions. E.g. 40-60% of GCA patients have PMR and PMR patients may have GCA.
* Both are relatively common and have definite target populations.
* Corticosteroids are the primary treatment.
* The published evidence suggests that discontinuation of steroids is feasible in a substantial number of patients with polymyalgia rheumatica and giant cell arteritis after an adequate period of treatment (up to 3-5 years), provided they are tapered gradually.
Polymyalgia Rheumatica

* **Poly** - many (Greek)
* **Myo** - one or more muscles (Greek)
* **Algia** - painful condition (Greek)

*Rheumatica* - “rheuma” (Greek) Greek rheumatismos, coined by Galen of Pergamum, a philosopher, physician, and pioneer of medical practice, in the 2nd century CE to describe joint diseases caused by the internal flow of “watery” humors..
### TABLE 2. Names Suggested for Polymyalgia Rheumatica by Various Authors

<table>
<thead>
<tr>
<th>Name</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senile rheumatic gout</td>
<td>Bruce,(^6^2) 1888</td>
</tr>
<tr>
<td>Secondary fibrosis</td>
<td>Slocumb,(^6^3,^6^4) 1936 and 1943</td>
</tr>
<tr>
<td>Periarthritis humeroscapularis</td>
<td>Meulengracht,(^6^5) 1945;</td>
</tr>
<tr>
<td></td>
<td>Meulengracht &amp; Schwartz,(^6^6) 1952</td>
</tr>
<tr>
<td>Peri-extraarticular rheumatism</td>
<td>Holst &amp; Johansen,(^6^7) 1945</td>
</tr>
<tr>
<td>Special arthritis of old age</td>
<td>Porsman,(^6^8) 1951</td>
</tr>
<tr>
<td>Myalgic syndrome of the aged</td>
<td>Kersley,(^6^9) 1951</td>
</tr>
<tr>
<td>with systemic reaction</td>
<td></td>
</tr>
<tr>
<td>Pseudo-polyarthrite rhizomélite</td>
<td>Forestier &amp; Certoncin,(^6^9) 1953</td>
</tr>
<tr>
<td>Anarthritic rheumatoid disease</td>
<td>Bgrabatuni,(^7^0) 1953</td>
</tr>
<tr>
<td>Polymyalgia rheumatica</td>
<td>Barber,(^7^1) 1957</td>
</tr>
</tbody>
</table>

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**MYALGIC SYNDROME WITH CONSTITUTIONAL EFFECTS**

**POLYMYALGIA RHEUMATICA**

**BY**

**H. STUART BARBER**

**Manchester**
Polymyalgia Rheumatica

- **Clinical Presentation:**
  - Age 50 or older at onset - often abrupt
  - Bilateral aching and morning stiffness which lasts 30 min or more for 1 month or more involving at least 2 of 3 areas
    - Neck or torso
    - Shoulders or proximal arms
    - Hips or proximal thighs
  - ESR = 40 mm/hr or greater

*Affects the synovium of certain joints and bursae but not the muscles per se.*

*May have low grade fever, weight loss, anorexia, and depression*
Table 1
Clinical features of polymyalgia rheumatica (PMR).

<table>
<thead>
<tr>
<th>Clinical feature</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain in shoulder girdle</td>
<td>90–100%</td>
</tr>
<tr>
<td>Morning stiffness (&gt;30 min)</td>
<td>90–100%</td>
</tr>
<tr>
<td>Bilateral upper arm tenderness</td>
<td>50–75%</td>
</tr>
<tr>
<td>Neck pain</td>
<td>30–60%</td>
</tr>
<tr>
<td>Pain in hip girdle</td>
<td>30–75%</td>
</tr>
<tr>
<td>Distal musculoskeletal manifestations(^a)</td>
<td>20–40%</td>
</tr>
<tr>
<td>Fever, malaise, anorexia</td>
<td>20–50%</td>
</tr>
</tbody>
</table>

\(^a\) Arthritis/arthralgia of the hands, pitting edema of the hands (RS\(_3\)PE syndrome), carpal tunnel syndrome.

Table 2
Abnormalities in laboratory tests in polymyalgia rheumatica.

<table>
<thead>
<tr>
<th>Test</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elevated erythrocyte sedimentation rate (ESR)</td>
<td>80–95%</td>
</tr>
<tr>
<td>Elevated C-reactive protein and/or ESR</td>
<td>&gt;90%</td>
</tr>
<tr>
<td>Anemia (normocytic)</td>
<td>20–50%</td>
</tr>
<tr>
<td>Thrombocytosis</td>
<td>&lt;20%</td>
</tr>
<tr>
<td>Elevated alkaline phosphatase</td>
<td>&lt;20%</td>
</tr>
</tbody>
</table>
**PMR Epidemiology**

*US-the average annual incidence PMR is 52.5 cases per 100,000 persons aged 50 years and older. The prevalence is approximately 0.5-0.7%.*

*Worldwide, the frequency varies by country. In Europe, the frequency decreases from north to south, with a high incidence in Scandinavia and a low incidence in Mediterranean countries. In Italy, for example, the incidence is 12.7 cases per 100,000 persons.*

*Whites are affected more than other ethnic groups. PMR is only occasionally reported in African-American persons. PMR is twice as common in females.*

*The incidence increases with advanced age. PMR rarely affects persons younger than 50 years. The median age at diagnosis is 72 years.*
Regional musculoskeletal disorders

- Rotator cuff tendinitis
- Frozen shoulder (adhesive capsulitis)
- Chest wall syndromes e.g. Tietze's disease
- Carpal tunnel syndrome
- De Quervain's tenosynovitis
- First carpometacarpal OA
- Trochanteric bursitis
- Compartments syndromes
- Morton's metatarsalgia
- Osgood-Schlatter's disease
- Achilles tendonitis
- Prepatellar bursitis
- Tennis elbow
- Olecranon bursitis
- Trigger finger
- Muscular neck pain (uni- or bilateral)
- Golfer's elbow
<table>
<thead>
<tr>
<th>Disease</th>
<th>Pain</th>
<th>Weakness</th>
<th>ESR</th>
<th>CPK</th>
<th>T4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fibromyalgia</td>
<td>Yes</td>
<td>No</td>
<td>Normal</td>
<td>Normal</td>
<td>Normal</td>
</tr>
<tr>
<td>Polymyalgia R.</td>
<td>Yes</td>
<td>No</td>
<td>Elevated</td>
<td>Normal</td>
<td>normal</td>
</tr>
<tr>
<td>Polymyositis</td>
<td>Usually none</td>
<td>Yes</td>
<td>Usually normal</td>
<td>Elevated</td>
<td>Normal</td>
</tr>
<tr>
<td>Steroid myopathy</td>
<td>No</td>
<td>Yes</td>
<td>Normal</td>
<td>Normal</td>
<td>Normal</td>
</tr>
<tr>
<td>Hyperthyroidism</td>
<td>No</td>
<td>Yes</td>
<td>Normal</td>
<td>Normal</td>
<td>Elevated</td>
</tr>
<tr>
<td>Hypothyroidism</td>
<td>Yes</td>
<td>No</td>
<td>Normal</td>
<td>Elevated</td>
<td>depressed</td>
</tr>
</tbody>
</table>
## Polymyalgia rheumatica vs late-onset rheumatoid arthritis

M. Cutolo, M. A. Cimmino and A. Sulli  
*(Rheumatology 2009 48(2):93-95)*

<table>
<thead>
<tr>
<th></th>
<th>PMR</th>
<th>late onset RA RF-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synovitis</td>
<td>23%</td>
<td>&gt; 80%</td>
</tr>
<tr>
<td>Age</td>
<td>Relatively younger</td>
<td>Older</td>
</tr>
<tr>
<td>Arthritis of PIP, MCP and wrist joints</td>
<td>Less frequent</td>
<td>Main sign</td>
</tr>
<tr>
<td></td>
<td>More myalgia</td>
<td></td>
</tr>
<tr>
<td>ESR &amp; CRP</td>
<td>higher ESR, CRP &amp; IL6.</td>
<td>Mildly elevated</td>
</tr>
<tr>
<td>HLA allele</td>
<td>HLA-DRB1 allele</td>
<td>HLA-DRB1 allele</td>
</tr>
<tr>
<td>Response to 15 mg steroid</td>
<td>Dramatic response</td>
<td>Slower response</td>
</tr>
</tbody>
</table>
Rheumatoid arthritis

Overview of joints affected

- Joints most frequently affected in RA include:
  - The proximal interphalangeal (PIP) and metacarpophalangeal (MCP) joints of the hands
  - The wrists
  - The shoulders
  - The elbows
  - The knees
  - The ankles, and
  - The metatarsophalangeal (MTP) joints of the feet

- Distal interphalangeal (DIP) joints are typically spared in RA.
Rheumatoid arthritis

Synovium

Normal joint:
- Cartilage
- Joint capsule
- Joint synovium

Joint affected by rheumatoid arthritis:
- Bone and cartilage erosion
- Swollen joint capsule
- Inflamed joint synovium
* The cause of PMR is unknown.

* PMR is closely linked to giant cell arteritis although it is controversial whether GCA and PMR are two separate diseases or part of the same spectrum of disease.

* One hypothesis is that in a genetically predisposed patient, an environmental factor, possibly a virus, causes monocyte activation, which helps determine the production of cytokines that induce manifestations of PMR and GCA.

* PMR is associated with the HLA-DR4 haplotype. High level of IL-6 is associated with increased disease activity.

* Although several infectious agents have been investigated as possible triggers, results are inconclusive.
Shoulder of patient with isolated PMR- no signs or symptoms of GCA.
(A) Ultrasonography-fluid within the subacromial bursa (arrows) and surrounding the long biceps tendon groove (arrowheads).
(B) Axial T2 weighted MRI- subacromial and subdeltoid bursitis (pentagon), joint effusion (arrow), and tenosynovitis of the long head of the biceps (arrowhead).
(C) Fluorodeoxyglucose PET- inflammatory fluorodeoxyglucose uptake in the shoulders (arrows).
Figure 4. Ultrasonography (A), MRI (B) of the hip and fluorodeoxyglucose PET (C) of patients with isolated untreated PMR (A) Ultrasonography - the presence of fluid within the trochanteric bursa (surrounding white line and arrows). (B) An axial T2 weighted section - trochanteric bursitis (arrows) and joint effusion (arrowhead). (C) Fluorodeoxyglucose PET - inflammatory fluorodeoxyglucose uptake in the hips (arrows) and absence of vascular uptake.
Giant cell arteritis

Polymyalgia Rheumatica

20-65%

Giant cell arteritis

Polymyalgia Rheumatica
* **PMR** treatment

* Dramatically responsive to steroids
* Most response to Prednisone <20mg/day (ACR guidelines 12.5-25 mg)
* Dose gradually tapered
* Tapering an art not science!
* Monitor for relapse, features of GCA, side-effects of corticosteroids
* Clinical course
* NSAIDs and intra-articular steroid- can help
* Methotrexate or tocilizumab in resistant cases
Giant cell arteritis (GCA) can alternatively be called cranial arteritis or temporal arteritis, reflecting the most commonly affected vessels.

GCA is the inflammation of the lining of the arteries and is a relatively common vasculitis among older adults.

Common symptoms of GCA include blurring or loss of vision, headaches, and jaw pain. Other areas such as the head and neck can also be affected by GCA.

Histologically, the tunica media thickens and the lumen narrows due to tunica interna fibrosis. Inflammatory cells can be seen invading the tunica media, especially lymphocytes and eosinophils. Giant cells can occasionally be seen populating areas around the internal elastic membrane.
Giant Cell Arteritis
Presenting symptoms

- Headache
- Scalp tenderness
- Thickened temporal arteries
- Jaw claudication
- Acute visual loss
- Weight loss, anorexia, fever, night sweats,
- Malaise, depression
1990 ACR criteria for the classification of giant cell arteritis

<table>
<thead>
<tr>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age at disease onset ≥50 years</strong></td>
</tr>
<tr>
<td>Development of symptoms or findings beginning at 50 years or older</td>
</tr>
<tr>
<td><strong>New headache</strong></td>
</tr>
<tr>
<td>New onset of or new type of localised pain in the head</td>
</tr>
<tr>
<td><strong>Temporal artery abnormality</strong></td>
</tr>
<tr>
<td>Temporal artery tenderness to palpation or decreased pulsation, unrelated</td>
</tr>
<tr>
<td>to arteriosclerosis of cervical arteries</td>
</tr>
<tr>
<td><strong>Increased ESR</strong></td>
</tr>
<tr>
<td>ESR ≥50 mm/h by the Westergren method</td>
</tr>
<tr>
<td><strong>Abnormal artery biopsy</strong></td>
</tr>
<tr>
<td>Biopsy specimen with artery showing vasculitis characterised by a</td>
</tr>
<tr>
<td>predominance of mononuclear cell infiltration or granulomatous inflammation,</td>
</tr>
<tr>
<td>usually with multinucleated giant cells</td>
</tr>
</tbody>
</table>

*For purposes of classification, a patient with vasculitis is said to have giant-cell (temporal) arteritis if at least three of these five criteria are present. The presence of any three or more criteria yields a sensitivity of 93.5% and a specificity of 91.2%. Adapted from reference 4.*
Table 1
Signs and symptoms of giant cell arteritis (GCA).

<table>
<thead>
<tr>
<th>Clinical feature</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cranial arteritis</td>
<td></td>
</tr>
<tr>
<td>Headache, facial pain</td>
<td>70–85%</td>
</tr>
<tr>
<td>Scalp tenderness</td>
<td>20–40%</td>
</tr>
<tr>
<td>Prominent or tender temporal arteries</td>
<td>30–60%</td>
</tr>
<tr>
<td>Jaw claudication</td>
<td>30–40%</td>
</tr>
<tr>
<td>Eye symptoms: sudden vision loss</td>
<td>15–45%</td>
</tr>
<tr>
<td>(transient or permanent), diplopia</td>
<td></td>
</tr>
<tr>
<td>or other ophthalmic manifestations</td>
<td></td>
</tr>
<tr>
<td>Stroke, transient ischemic attacks</td>
<td>&lt;15%</td>
</tr>
<tr>
<td>and other neuropsychiatric manifestations</td>
<td></td>
</tr>
<tr>
<td>Vestibulo-auditory manifestations: hearing loss</td>
<td>5–25%</td>
</tr>
<tr>
<td>tinnitus, vertigo</td>
<td></td>
</tr>
<tr>
<td>Tongue or scalp infarction</td>
<td>&lt;5%</td>
</tr>
<tr>
<td>Extracranial arteritis</td>
<td></td>
</tr>
<tr>
<td>Aortic arch syndrome, aortic-valve insufficiency</td>
<td>5–20%</td>
</tr>
<tr>
<td>aortic aneurysm or dissection.</td>
<td></td>
</tr>
<tr>
<td>Clinically significant involvement of other arteries</td>
<td>5–20%</td>
</tr>
<tr>
<td>Peripheral neuropathies</td>
<td>&lt;15%</td>
</tr>
<tr>
<td>Respiratory symptoms (cough, sore throat, hoarseness)</td>
<td>&lt;15%</td>
</tr>
<tr>
<td>Systemic symptoms</td>
<td></td>
</tr>
<tr>
<td>Fever, malaise, fatigue, anorexia, weight loss</td>
<td>30–60%</td>
</tr>
<tr>
<td>PMR</td>
<td></td>
</tr>
<tr>
<td>Bilateral aching and stiffness of the shoulder girdle</td>
<td>20–65%</td>
</tr>
<tr>
<td>sometimes the neck and hip girdle.</td>
<td></td>
</tr>
</tbody>
</table>
Table 2. Specificity and Sensitivity of Signs and Symptoms in Patients with Suspected Giant-Cell Arteritis*

<table>
<thead>
<tr>
<th>Sign or Symptom</th>
<th>Sensitivity (95% CI)†</th>
<th>Positive Likelihood Ratio (95% CI)‡</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jaw claudication</td>
<td>0.34 (0.29–0.41)</td>
<td>4.2 (2.8–6.2)</td>
</tr>
<tr>
<td>Diplopia</td>
<td>0.09 (0.07–0.13)</td>
<td>3.4 (1.3–8.6)</td>
</tr>
<tr>
<td>Prominent or enlarged temporal artery</td>
<td>0.47 (0.40–0.54)</td>
<td>4.3 (2.1–8.9)</td>
</tr>
<tr>
<td>Synovitis</td>
<td></td>
<td>0.4 (0.2–0.7)</td>
</tr>
<tr>
<td>Headaches</td>
<td>0.76 (0.72–0.79)</td>
<td>1.2 (1.1–1.4)</td>
</tr>
<tr>
<td>Erythrocyte sedimentation rate</td>
<td>0.96 (0.93–0.97)</td>
<td>1.1 (1.0–1.2)</td>
</tr>
</tbody>
</table>

* Modified with permission from Smetana and Shmerling (52).
† Defined as the frequency in patients with biopsy-proven giant-cell arteritis.
‡ Defined as the frequency of the sign or symptom in patients with giant-cell arteritis compared with the frequency in patients who had a negative result on temporal artery biopsy.
Many of the clinical features commonly found with the disease are unhelpful in predicting the likelihood of positive temporal artery biopsy results.

Jaw claudication and diplopia substantially increase the probability of positive biopsy results (positive LRs = 4.2 and 3.4, respectively).

No historical findings help rule out the diagnosis by their absence.
Among physical examination findings, synovitis makes the diagnosis of TA less likely, while beaded, prominent, enlarged, and tender temporal arteries each increase the likelihood of positive biopsy.

Beaded, prominent, or enlarged arteries confer the highest positive LRs of any clinical or laboratory feature and substantially increase the probability that a patient with suspected TA will have positive biopsy results.

While these findings increase the chance of having TA, they are variably sensitive, from 16% (beaded temporal artery) to 65% (any temporal artery abnormality).
* A normal ESR (LR = 0.2) or ESR less than 50 mm/h (LR = 0.35) each make positive biopsy results unlikely, but setting the ESR threshold at 100 mm/h is less efficient, as patients with an ESR less than 100 mm/h have an LR (0.8).

* Clinically suspected of disease, those with an ESR greater than 100 mm/h have a modestly increased likelihood of biopsy-proven TA (LR = 1.9).

Does This Patient Have Temporal Arteritis?
JAMA. 2002;287(1):92-101
**Conclusions:**

*Review of clinical series of patients with suspected TA does not allow a determination of the predictive value of selected combinations of clinical and laboratory features.*

*In addition, it is not possible to determine whether certain combinations of features would sufficiently increase the likelihood of disease that a clinician should treat presumptively for TA and not perform a biopsy at all.*

*The morbidity of a prolonged course of corticosteroids, however, is such that most clinicians would favor confirmation of disease by biopsy even if the clinical probability is high.*

Does This Patient Have Temporal Arteritis? JAMA. 2002;287(1):92-101
Inflammation

- A protective response involving host cells, blood vessels and proteins
  - Goals are:
    - eliminate the initial cause of cell injury
    - Remove necrotic cells and tissue
    - Initiate the process of repair

- Also a potentially harmful process
  - Components of inflammation that are capable of destroying microbes can also injure bystander normal tissue
Features of chronic inflammation

- Chronic inflammation = long duration
- Components:
  - Lymphocyte, plasma cell, macrophage (mononuclear cell) infiltration
  - Tissue destruction by inflammatory cells
  - Repair with fibrosis and angiogenesis (new vessel formation)
Histopathological features of giant-cell arteritis. Transverse sections of temporal artery-untreated GCA (A) Granulomatous inflammation and multinucleated giant cells (arrows) at junction of media and intima.. (B) A mononuclear transmural infiltrate without giant cells (C) Vasculitis involving small vessels (arrows) close to a non-inflamed temporal artery.
Consequences of blood vessel wall inflammation

A. Normal Artery
   - Normal Blood Flow

B. Narrowed Artery (with inflammation)
   - Decreased Blood Flow
   - Artery Wall
   - Artery Cross-Section
   - Inflammation

C. Totally Occluded Artery
   - No Blood Flow
   - Inflammation and scarring

D. Aneurysm
   - Abnormal Blood Flow
   - Thrombus (clot)
   - Dilation containing very thin arterial wall
Salvarani, C. et al. (2012) Clinical features of polymyalgia rheumatica and giant cell arteritis
Nat. Rev. Rheumatol. doi:10.1038/nrrheum.2012.97
The pathogenic pathways implicated in granulomatous lesions in giant-cell arteritis


Gross architecture of a granuloma with macrophages, dendritic cells, and multinucleate giant-cells forming the core of the sphere, surrounded by a shell of lymphocytes
The systemic inflammatory response in giant-cell arteritis and polymyalgia rheumatica. Vessel wall inflammation is preceded and accompanied by an intense acute-phase response. Circulating macrophages are activated and release interleukin (IL)-1 and interleukin-6, critical inducers of a multiorgan reaction involving the liver, the central nervous system, the vascular system, the bone marrow, and the immune system. Hepatic acute-phase reactants are useful in the laboratory diagnosis of giant-cell arteritis and polymyalgia rheumatica. The systemic inflammatory response can exist in the absence of fully developed vasculitis, as in the case of polymyalgia rheumatica. CRP = C-reactive protein.
Figure 3 Pathologic analysis of sections adjacent to those containing VZV antigen from GCA-positive temporal arteries. Temporal arteries (TAs) in which varicella-zoster virus (VZV) antigen was detected immunohistochemically were further analyzed pathologically.

Incidences of severe giant cell arteritis in the arteries of head and neck. ST indicates superficial temporal artery; V, vertebral; O, ophthalmic; PC, posterior ciliary; IC, internal carotid; EC, external carotid artery and branches in the neck; CR, central retinal artery.

Polymyalgia Rheumatica

Giant cell arteritis

20-65%

Polymyalgia Rheumatica

Giant cell arteritis

?
Giant Cell Arteritis

A, circumferential thickening of the subclavian artery (arrow); B, circumferential thickening of the axillary artery (arrow).

CT scan circumferential thickening of the subclavian artery (long arrow) and primary carotid artery (short arrow).

Long stenotic segment of the humeral, axillary, and subclavian arteries (arrows).

A, circumferential thickening of the descending thoracic aorta; B, circumferential thickening of the abdominal aorta (arrow).

Long stenotic segment of the superficial femoral arteries (arrows).
Computed tomographic angiography (CTA) shows the results of aortic-root repair and aortic-arch replacement with an “elephant trunk graft” in a 71-year-old woman who had biopsy-confirmed giant-cell arteritis.

Aortic arch and its branches in a 72-year-old woman with biopsy-positive giant-cell arteritis. Arrows indicate stenotic lesions in the bilateral subclavian and axillary arteries, and arrowheads indicate long-segment occlusions of the proximal brachial arteries.
More pearls about temporal artery biopsy
Involvement of the eye in giant cell arteritis

- **Eye manifestations**
  - Anterior ischemic optic neuropathy (AION or AAION)
  - Posterior ischemic optic neuropathy (PION)
  - Arterial occlusion (occlusion of a central artery, branch artery, or cilioretinal vessel)
  - Amaurosis fugax
  - “Cotton-wool spots” (microinfarcts of the retinal nerve fiber layer)
  - Double vision (involvement of muscles, cranial nerves, or brainstem)
  - Ocular ischemic syndrome (hypotension, iritis)
a) Anterior ischemic optic neuropathy with swelling of the optic disk
b) Central artery occlusion
*Hayreh & Zimmerman*

363 cases of suspected GCA referred for TA Bx (106+, 257-)

* 21.2% with visual loss and +TA Bx- no other symptoms
* 55.7% with + TA Bx had new onset localized HA- so did 45.5% with a negative TA Bx.
* 19.8% with + TA Bx had TA tenderness or decreased pulsation- so did 12.8% with negative TA Bx.
* Normal ESR did not rule out GCA.

Hayreh & Zimmerman Study

Temporal Artery Biopsy

‘Skip lesions’ – fact or fiction?
In the H&Z study, taking a 2.5cm biopsy with serial sectioning yielded a 100% positive TAB rate in GCA patients

TABs for every patient?
1. GCA is a well-known masquerader
2. The risks of steroid-related systemic complications

Low yields (3-4%) from bilateral TABs suggests unjustified
Steroids therapy does NOT significantly alter pick-up rate

*** DO NOT WITHHOLD STEROIDS TO WAIT FOR TAB ***
Color-coded duplex sonography of the temporal artery

Normal frontal branch- longitudinal a. and b. transverse views
Acute temporal arteritis- showing hypoechoic wall thickening (arrows), longitudinal c. and d. transverse views

Dtsch Arztebl Int. 2013 May; 110(21): 376-386.
<table>
<thead>
<tr>
<th>Initial Prednisone Dose</th>
<th>40–60 mg QD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commence Prednisone Tapering</td>
<td>Once ESR* has normalized</td>
</tr>
<tr>
<td>Tapering Schedule</td>
<td>Decrease dose by 5 mg/week until 20 mg; then by 2.5 mg every 2 weeks, as tolerated</td>
</tr>
<tr>
<td>Goal Prednisone Dose at Six Months</td>
<td>7.5–15 mg QD</td>
</tr>
<tr>
<td>Expected Duration of Therapy</td>
<td>1–2 years</td>
</tr>
</tbody>
</table>

*ESR: erythrocyte sedimentation rate
### A Giant-Cell Arteritis

**Induction Therapy**
- Prednisone, 1 mg/kg/day
- Goal: resolution of laboratory and clinical abnormalities
- Course: generally 2–4 wk
- Begin bone-protective therapy
- Consider aspirin
- Consider gastroduodenal protection

**Maintenance Therapy**
- Taper prednisone by 10–20%/mo
- Monitor clinically
- Monitor acute-phase reactants (ESR and CRP)
- When dose <10 mg/day, taper by 1 mg/mo

**Management of Flares**
- Severe flare: repeat prednisone induction therapy
- Mild flare: increase prednisone by 10–20%
- Be cautious in treating elevated ESR or CRP level in absence of clinical symptoms
- Glucocorticoid-sparing agents: methotrexate, marginal benefit; infliximab, no benefit; dapsone, adalimumab, leflunomide, hydroxychloroquine, tocilizumab, azathioprine, anecdotal use

### B Polymyalgia Rheumatica

**Induction Therapy**
- Prednisone, 15–20 mg/day
- Goal: remission of myalgias, stiffness, constitutional symptoms
- Course: generally 1–2 mo
- Consider bone-protective therapy

**Maintenance Therapy**
- Taper prednisone by 20%/mo
- Monitor clinically
- Monitor acute-phase reactants (ESR and CRP)
- When dose reaches 10 mg/day, taper slowly

**Management of Flares**
- Reassess diagnosis, rule out vasculitis, consider temporal-artery biopsy, and consider large-vessel imaging
- Increase prednisone by 10–20%
- Rettempt taper
- Glucocorticoid-sparing agents: methotrexate marginally effective

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### Table 4. Key Considerations in the Therapeutic Management of Giant-Cell Arteritis

<table>
<thead>
<tr>
<th>Prognosis is excellent. Life expectancy is normal (giant-cell arteritis) or prolonged (polymyalgia rheumatica) in treated patients. Many patients no longer receive therapy after 2 years.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corticosteroids are the mainstay of treatment; no conclusive evidence for steroid-sparing effect of other immunosuppressants.</td>
</tr>
<tr>
<td>Adjunctive therapy should include bone-saving measures.</td>
</tr>
<tr>
<td>Systemic inflammatory responses and symptoms of polymyalgia rheumatica are highly sensitive to corticosteroids; vascular lesions, driven by adaptive immune responses, seem relatively resistant to immunosuppression.</td>
</tr>
<tr>
<td>In the chronic phase of the disease, most patients are clinically stable, although there is laboratory evidence of smoldering disease.</td>
</tr>
<tr>
<td>Vascular complications are infrequent after the initiation of corticosteroid therapy; some patients may develop aortic aneurysm, but the number of patients at risk for this complication and the responsiveness of aortitis to therapy are unclear.</td>
</tr>
</tbody>
</table>