

Thoracoscopic Thymectomy In Myasthenia Gravis In Children (About 4 Cases)

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I. Introduction :

Myasthenia gravis (MG) is an autoimmune disorder of the postsynaptic neuromuscular junction resulting in fatigability of voluntary muscles. There has been increasing evidence supporting thymectomy for MG in adults, and the role of surgery in pediatric age groups is increasing too.

surgical procedure not very common especially in pediatric surgery and whose minimally invasive approach has considerably taken its place. It's a thoracoscopic Thymectomy.

II. Methods :

All patients with juvenile MG who underwent thoracoscopic thymectomy at the department of pediatric surgery at the Hassan II university Hospital of Fès between 2015 and 2023 were included.

Patients were diagnosed with MG by their treating neurologist based on history, physical examination, positive response to anticholinesterase agents, and positive acetylcholine receptor antibodies.

Status of the disease postoperatively was assessed by the DeFilippi classification at their last follow up. Both preoperative and postoperative classifications were determined by the same treating neurologist.

4 cases: 3 cases of MG and one case of thymoma

Case 1: Jihad ; 12 years old → Myasthenia gravis (MG)

Case 2: Wiam ; 6 years old → Myasthenia gravis (MG)

Case 3: Fatima Zahra ; 15 years old → Myasthenia gravis (MG)

Case 4: Assia; 8 years old → Thymoma

III. Results :

Pre operative characteristics :

| | Jihad MG | Wiam MG | Fatima Z MG | Assia Thymoma |
|---|--|----------------------------|----------------------------|--|
| Age and gender | 12 M | 6 F | 15 F | 8 F |
| Symptoms | Osseman Group III | Osseman Group II b | Osseman Group II b | cough, chest pain, difficulty breathing |
| Seropositivity | Ach R + Musk + | Ach R + Musk - | Ach R + Musk - | Ach R - Musk - |
| Management at pre-op | Pyridostigmine Steroids Chronic IVIG Plasmapheresis | Pyridostigmine Steroids | Pyridostigmine Steroids | Steroids |
| Duration between diagnosis and surgery in months | 10 | 12 | 13 | 6 |

The duration between diagnosis and surgery was around 12 months except in the case of thymoma which the suspected diagnosis and the symptomatology required earlier surgery

Myasthenia classification, Osseman and al criteria

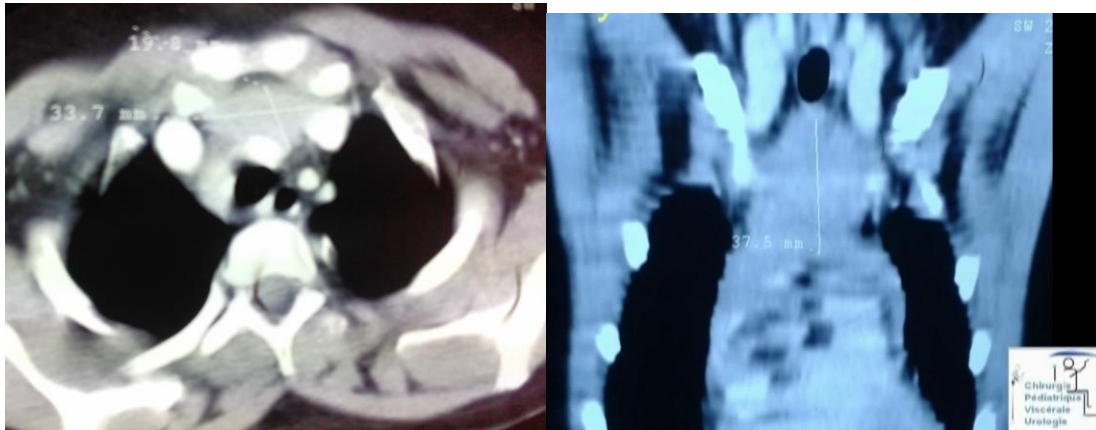
- **Group I :** ocular symptoms
- **Group II a :** Mild, Generalized symptoms (including bulbar)

- **Group II b: Moderate , Generalized symptoms**
- **Group III: Acute, fulminating symptoms**

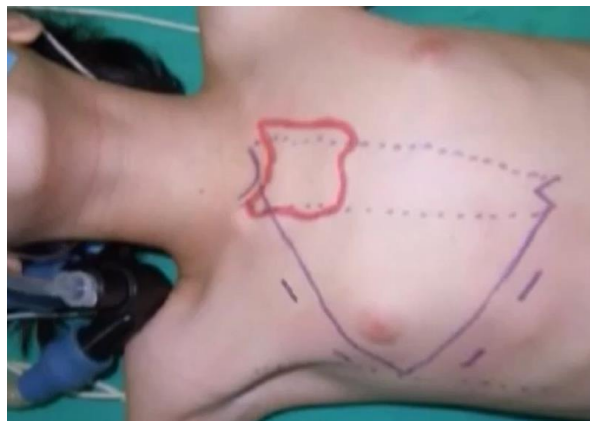
DeFilippi classification of remission

(Post op)

- **Class I :Complete remission, no medication requirements**
- **Class II :asymptomatic, decreased medication requirements**
- **Class III: improvement in symptoms, decreased medication requirements**
- **Class IV: no change in symptoms or medication requirements**
- **Class V: worsening symptoms**



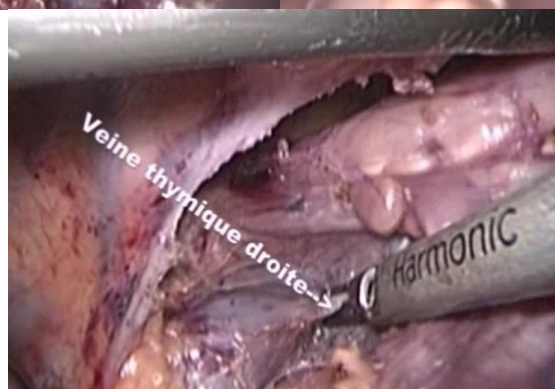
Surgical technique :



**Supine position, arm abduction
3 ou 4 ports**



The thymus dissected off the pericardial sac and aorta



Major arteries and veins were ligated with ligasure



The thymus retrieved by the posterior 10 mm port

Peri operative characteristics :

| | Jihad MG | Wiam MG | Fatima Z MG | Assia Thymoma |
|--------------------------------|----------|---------|-------------|---------------|
| Duration of surgery in minutes | 140 | 120 | 100 | 120 |
| chest tube insertion | + | + | + | + |
| Length of ICU stay in days | 1 | 1 | 1 | 1 |
| Conversion to open | 0 | 0 | 0 | 0 |
| Intraoperative complications | 0 | 0 | 0 | 0 |

Post operative :

| | Jihad MG | Wiam MG | Fatima Z MG | Assia Thymoma |
|---|---------------------|--------------------|------------------------|--------------------------|
| Duration of chest tube removal in days | 1 | 1 | 1 | 1 |
| Follow up (months) | 120 | 96 | 6 | 72 |
| Length of stay (days) | 3 | 2 | 2 | 2 |
| Histopathology | Thymic hyperplasia | Thymic hyperplasia | Thymic hyperplasia | Encapsulated Thymoma |
| DeFilippi Classification | II | I | I | II |
| Mortality | 0 | 0 | 0 | 0 |

IV. Discussion :

Surgery for MG in children is indicated for antibody receptor positive patients with moderate to severe disease. The exact mechanism for reduced antibody production post thymectomy is largely unknown, but may be secondary to eliminating antigenic stimulation and removing B cells. Slightly better than the current literature, 100% of our patients improved clinically following right-sided thoracoscopic thymectomy and there were no 30-day complications.

Thymectomy is the treatment of choice for thymic pathology (Myasthenia gravis, Thymoma)

Thoracoscopy is safe and effective. Performing the resection using this technique avoids the lack of visualization and potential suboptimal dissection of the inferior pole of the thymus

Some authors claim that thoracoscopic approach might leave residual thymic tissue leading to reduced surgical benefit are proving to be unfounded.

V. Conclusion :

To conclude, these are some important messages :

- « Early » Thymectomy: 12 months → Higher remission
- **Indications :**
Myasthenia (AChR-positive with moderate to severe symptoms)
Thymoma (encapsulated stade I otherwise radiotherapy or chemotherapy pre op)
- **Thymectomy** = Thymus gland + pericardial fat → Better result
- **Right** thoracoscopic thymectomy : access to the thymus near the superior vena cava
- **Left** thoracoscopic thymectomy : access to the ectopic thymus

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