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EXPLORATION OF URINARY METALS AFTER PECTUS BAR PLACEMENT

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INTRODUCTION:

Implanted **osteosynthesis materials** are composed of metals that can be released into the surrounding tissues and enter the bloodstream in a process known as **METALLOSIS**.

This could cause **sensitization**.

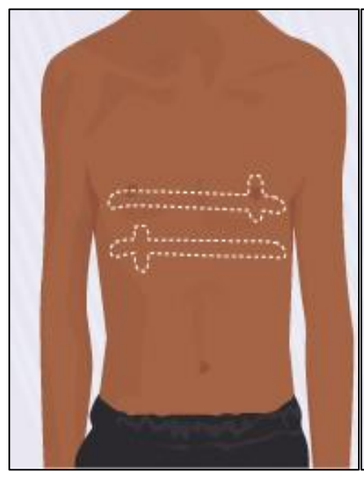
METHODS:

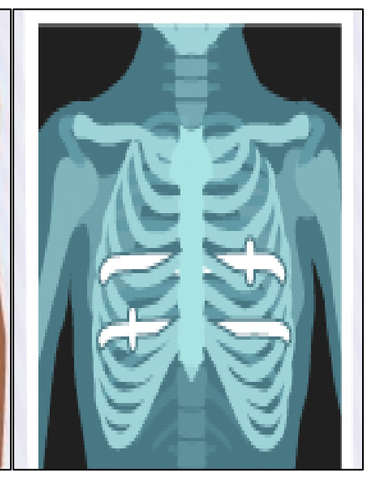
A prospective study was conducted on patients undergoing pectus bar removal starting **October 2024** at a pediatric hospital. Urinary levels of **nickel**, **vanadium**, **molybdenum**, and **chromium** were measured on the day of surgery (**D0**), the first postoperative day (**D1**), and three months later (**M3**).

RESULTS:

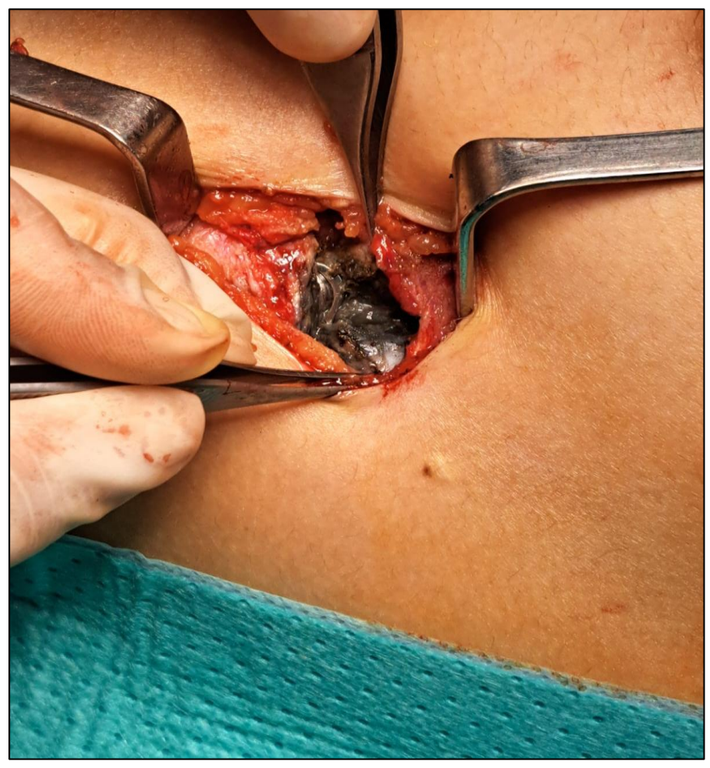
5 patients (3 females and 2 males). Average age: **13 years**.

- No metal sensitization in skin tests.
- One case of chest dermatitis after bar placement (no tests performed).
- **Nickel**: main elevated metal → **D0**: 5.4 mcg/L ± 2.6 (VR 0-5.0 mcg/L). **D1**: 8.8 mcg/L ± 8 on D1.
- **Molybdenum**: **D0**: 89 mcg/L ± 26.9 (VR 10-124 mcg/L). **D1**: Substantial decrease (23.8 mcg/L ± 11.8).
- The remaining metals showed no significant alterations.





Element (unit)	Time	Patient 1	Patient 2	Patient 3	Patient 4	Patient 5
Nickel (mcg/L)	D0	2.4	**9.2**	3.6	6.7	5.2
	D1	1.8	7.4	6.6↑	5.8	**22.8**↑
	3M	**5.9**↑	5.3	-	-	-
Vanadium (mcg/g)	D0	0.19	0.19	**0.29**	**0.29**	**0.39**
	D1	**0.29**	**0.39**	0.29	**0.59**	0.29
	3M	0.19	0.19	-	-	-
Molybdenum (mcg/L)	D0	**122**	59	81	**112**	71
	D1	17↓	20↓	11↓	30↓	41↓
	3M	95	92	-	-	-
Chromium (mcg/L)	D0	2	2.9	2.7	**9.5**	1.1
	D1	**4.2**	**6.3**	**5.6**	8	**8.2**
	3M	1.7	2.4	-	-	-



Metallosis produced in a Nuss bar

CONCLUSIONS

- Patients who undergo thoracoplasty bar implantation may suffer from **metallosis**, which is documented macroscopically as dark discoloration of the surrounding tissues and which we have demonstrated through urinary analysis; this could cause **metal sensitization** and be related to the skin or **hypersensitivity reactions** that some patients experience.
- **Nickel** is the main metal elevated in urine, and its elevated levels on D1 suggest that **mobilization of the material** may accentuate metallosis.
- Although these results are exploratory, they represent a novel finding not previously described, which may have implications for **establishing protocols for perioperative allergy assessment and implantable devices**.