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Multiple myeloma uncovered by investigating a negative serum iron level

A 67-year-old woman had left nostril obstruction for several weeks, which was thought to be due to a simple nasal polyp. Routine laboratory tests showed anaemia (haemoglobin 7.2 g/l (reference range 11.6–14.0)) and a negative serum iron level ($-68.2 \mu\text{mol/l}$ (7.2–26.9)) was detected with an automatic analyser (Hitachi 7600, Hitachi, Tokyo, Japan). Interference in the direct method of iron measurement was suspected and an investigation of the abnormal absorbance pattern (fig 1) was conducted. We combined the patient's serum with pooled serum at dilution factors 2, 3, 5 and 10, and measured the iron levels. The iron levels were -1.8 , 3.4 , 5.4 and $5.4 \mu\text{mol/l}$, respectively, confirming that the interference was diluted by the pooled serum. Monoclonal immunoglobulins (Igs) can interfere with iron measurement.¹ In our patient, we found significantly high concentrations of IgG (85 g/l (7–16)) and β_2 -microglobulin (3.9 mg/l (1.0–2.7)), combined with low concentrations of IgA (0.3 g/l (0.7–4.0)) and IgM (0.2 g/l (0.4–2.3)). A monoclonal IgG- λ was shown

by immunofixation, and a presumptive diagnosis of multiple myeloma was made. The polypoid mass blocking the patient's left nostril was removed and proved to be an extramedullary plasmacytoma by histopathological examination. Moreover, bone marrow examination showed increasing numbers of plasmacytoid cells (69%), confirming a diagnosis of multiple myeloma.

Blood specimens from patients with multiple myeloma are known to generate erroneous laboratory data through a variety of mechanisms, and monoclonal IgM is more often responsible than monoclonal IgG in this regard.^{2–4} Monoclonal immunoglobulins have often been reported to cause positive interference with direct iron assays,^{1–5} but to our knowledge negative interference in serum iron measurement due to monoclonal Igs has not been reported previously in the English literature. Recent improvement of the reagent buffers used in serum iron tests has considerably decreased the interference. However, the present case shows that such interference may still take place. A negative iron value is usually due to EDTA contamination of sera, which can be suspected on finding low calcium and high potassium concentrations.⁶ However, in our case, serum calcium and potassium levels were normal, so we ruled out the possibility of EDTA contamination. We were extremely satisfied to uncover a hitherto undiagnosed multiple myeloma in this patient. We recommend that laboratory professionals be vigilant whenever confronted with unrealistic test results, and the

possibility of interfering substances (such as drugs, heterophilic antibodies and paraproteins) must be thoroughly investigated.

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Figure 1 (A) The absorbance (Abs) pattern for determination of iron in a patient with a serum iron concentration (Cons) of $40.8 \mu\text{mol/l}$ ($228 \mu\text{g/dl}$) was normal. The patient's serum was initially admixed with the primary reagent. The absorbance was negative (around -105). When the secondary reagent was added immediately after the 16th detection, the absorbance sharply increased to 550. (B) The iron absorbance pattern of this patient was abnormal (iron concentration $-68.2 \mu\text{mol/l}$ ($-381 \mu\text{g/dl}$)). In the beginning, the absorbance was positive (around 100) and decreased gradually. After the secondary reagent was added, the absorbance further decreased more quickly.

Vulval intraepithelial neoplasia with extra mammary pagets disease: a rare association

Vulval intraepithelial neoplasia (VIN) is the term used for squamous intraepithelial lesions of the vulva, and is classified based on the thickness of epithelium showing dysplasia. The incidence of VIN has nearly doubled over the past two decades and is becoming more frequent in young women aged 20–35 years.¹ Extra mammary Paget's disease comprises $\leq 2\%$ of primary vulval neoplasms, and extra mammary Paget's disease arising in other sites is even rarer. Incidence of an underlying neoplasm detected in cases of vulval extra mammary Paget's disease ranges from 0% to 30% in various studies.² However, it is extremely rare to encounter VIN with extra mammary Paget's disease in the vulva. We present one such rare and interesting association of these two diseases.

A 65-year-old woman presented with whitish plaques on the vulva, along with