**Clinical Case Study**

# Unusual Serum Electrophoresis Pattern in a Woman with Pancreatic Carcinoma

Joris R. Delanghe,[1*] Marc L. De Buyzere,[2] Veerle Casneuf,[2] and Marc Peeters[2]

Departments of [1] Clinical Chemistry and [2] Gastroenterology, University Hospital Ghent, Ghent, Belgium.
*Address correspondence to this author at: Department of Clinical Chemistry, University Hospital Ghent, De Pintelaan 185 (2P8), B-9000 Gent, Belgium. Fax +32-9-332-4985; e-mail joris.delanghe@ugent.be.

## CASE DESCRIPTION

A 51-year-old woman presented with progressive severe icterus associated with advanced inoperable pancreatic carcinoma. Biopsy of the liver revealed metastasis of a moderately differentiated adenocarcinoma, possibly of pancreatic origin. Imaging studies did not show any primary tumor in the pancreas but did reveal a deep vein thrombosis of the left lower extremity and a pulmonary embolism. Bone scans revealed metastases. The patient began treatment with chemotherapy (gemcitabine), radiotherapy to alleviate pain, and placement of a percutaneous transhepatic stent in the right biliary system because of progressive icterus.

Routine biochemical investigation of the patient's serum revealed increased total bilirubin (275 $\mu$mol/L, reference value <22 $\mu$mol/L), which consisted mainly of direct bilirubin (215 $\mu$mol/L, reference value <4 $\mu$mol/L). The cytosolic liver enzymes alanine aminotransferase (115 U/L) and aspartate aminotransferase (143 U/L) were moderately increased. The serum protein concentration was 68 g/L (reference interval 60–85 g/L), but capillary electrophoresis of serum proteins (Capilaris, Sebia) demonstrated a low albumin fraction together with a marked additional peak observed between the $\beta$ and the $\gamma$ region. Results of immunofixation with antibodies against G, M, and A heavy chains and κ and λ light chains were negative, indicating that this additional electrophoretic fraction did not indicate the presence of a paraprotein. Agarose gel electrophoresis confirmed the abnormal pattern, ruling out analytical interference caused by atypical ultraviolet absorbance.

| Questions to Consider |
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| • Explain the potential causes of an abnormal electrophoresis pattern. |
| • Describe the factors that should be considered in cases of positive serum protein electrophoresis and negative immunofixation. |
| • List things that the laboratory can do to resolve such cases. |

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**Final Publication and Comments**

The final published version with discussion and comments from the experts will appear in the September 2008 issue of *Clinical Chemistry*. To view the case and comments online, go to http://www.clinchem.org/content/vol54/issue9/ and follow the link to the Clinical Case Study and Commentaries.

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