

Curiositas

GENERAL PRACTICE QUIZ

A 39 year old man presents with a swelling in his neck that has been progressively enlarging over the last few months.



1. What clinical tests would you perform to assess him?
2. The swelling moves upwards when the tongue is protruded. What is the likely cause, and how common is this condition?
3. Describe the embryological origin of the thyroid and its significance in this case.

A representative image from his CT scan is shown below.



Glenn Ritchie (Medical Student, Queen's University Belfast) and Dr Ian Bickle (Consultant Radiologist, Raja Isteri Penigran Anak Saleha Hospital, Bandar seri Begawan, Brunei Darussalam)

MEDICAL STUDENT QUIZ



1. With regard to skin cancer, what does this image represent?
2. What is the clinical significance of this region?
3. Explain Mohs' micrographic surgery

Claire Lagan (Biomedical Scientist, Queen's University Belfast) and Dr Joe Houghton, Clinical Senior Lecturer (Queen's University Belfast)

POSTGRADUATE QUIZ



1. What abnormality is shown on the CT image above?
2. What procedure can this be a complication of?
3. What is the German term that links this radiological sign with the photograph on the right?

Michael Corr (Medical Student, Queen's University Belfast) and Dr Ian Bickle (Consultant Radiologist, Raja Isteri Penigran Anak Saleha Hospital, Bandar seri Begawan, Brunei Darussalam)

AND FINALLY...

A patient with chronic lymphocytic leukaemia attends for routine clinical review. Venous blood is sent for analysis and the laboratory phone urgently with the results shown in panel A. A further blood sample is collected using an alternative blood bottle, and the results in panel B are returned.

| | A (Clotted) | B (Heparin) | C (Clotted) | D (Heparin) |
|------|----------------|----------------|----------------|----------------|
| NA | 137 | 132 | 136 | 136 |
| K | 6.7 | 7.3 | 4.4 | 4.6 |
| CL | 103 | 103 | 102 | 102 |
| CO2 | 25 | 22 | 23 | 23 |
| UREA | 6.8 | 6.8 | 7.0 | 6.7 |
| CRE | 112 | 121 | 126 | 123 |

The patient is not on potassium supplements or drugs linked with hyperkalaemia. An ECG is normal. He is not given any treatment, but two further blood samples are sent to the laboratory urgently and the results in panel C and D are returned.

1. How would you explain the change in the potassium result?
2. What conditions predispose to this phenomenon?
3. How should an accurate potassium concentration be obtained in these circumstances?

Dr Paul Hamilton (Specialty Registrar, Chemical Pathology, Belfast Health and Social Care Trust)

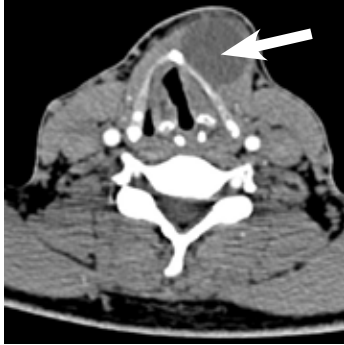
ANSWERS See overleaf

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Curiositas: Answers

GENERAL PRACTICE QUIZ

1. Abnormalities of the thyroid gland or thyroglossal duct can cause swelling in this midline location. Thyroid swellings move on swallowing, while thyroglossal cysts tend to move when the tongue is protruded.
2. A thyroglossal cyst is a common painless midline neck swelling. Approximately 7% of people have remnants of the thyroglossal duct¹. It is the commonest cause of midline neck swellings in children, accounting for 70% of congenital neck abnormalities; 76% of cases present before the age of 6 years¹.



3. Derived from endoderm, the thyroid primordium descends in the midline of the neck from the base of the tongue and courses anterior to the hyoid bone to an infrahyoid position anterior to the thyrohyoid membrane, thyroid cartilage, and trachea². The inferior portion of the thyroglossal duct differentiates into the pyramidal lobe of the thyroid gland². As such, thyroglossal duct cysts are found below the hyoid bone in 85% of cases, but can lie anywhere between the foramen caecum and the suprasternal notch¹. Due to its attachment to the tongue, protrusion of the tongue will raise a thyroglossal cyst superiorly. This classical sign is virtually pathognomonic of thyroglossal duct cysts.

1) Karmakar S et al. Thyroglossal Cyst: An Unusual Presentation. *Indian J Otolaryngol Head Neck Surg.* 2012; 65(S1):185–7.

2) Zander DA and Smoker WRK. Imaging of Ectopic Thyroid Tissue and Thyroglossal Duct Cysts. *RadioGraphics.* 2014;34(1):37–50.

Glenn Ritchie (Medical Student, Queen's University Belfast) and Dr Ian Bickle (Consultant Radiologist, Raja Isteri Penigran Anak Saleha Hospital, Bandar seri Begawan, Brunei Darussalam). Thank you to the patient who kindly gave written consent for these images to be published.

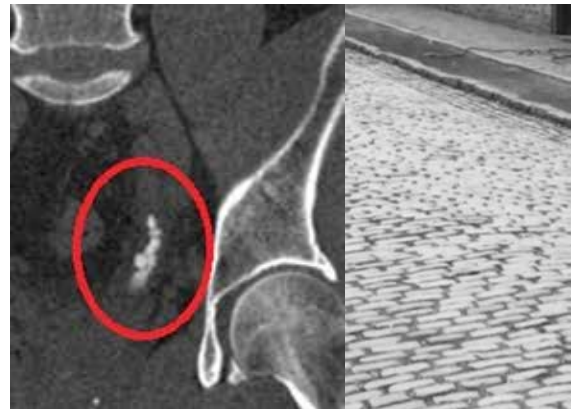
MEDICAL STUDENT QUIZ

1. The image depicts the H-zone which is an anatomical region of the face that includes the temple, ear, eyelids, nose and lips.
2. The H-zone is considered a high-risk site for basal cell carcinoma, the commonest human cancer. Tumours that arise in this region often have a greater extent of invasion than is initially appreciated by clinicians, and therefore attempts at routine primary excision are less likely to be successful. These regions also tend to be cosmetically sensitive.
3. Mohs' micrographic surgery is a technique that is used to treat high-risk cutaneous basal cell carcinoma. The method was developed by Frederic Edward Mohs in 1938 at the University of Wisconsin. The technique involves initially removing the tumour with a minimal amount of surrounding healthy tissue. Detailed microscopic examination (by a histopathologist or suitably trained clinician) of the surgical margins of the carefully orientated excised specimen is then carried out whilst the patient is still at clinic. If the margins are clear then surgery is complete. If the margins are positive then small amounts of further tissue are removed in the relevant area(s) until clear margins are finally obtained. Recurrence rates are lower using this technique compared with standard excision, and a better cosmetic result is more likely. However, this technique is labour intensive and is therefore quite costly.

Claire Lagan (Biomedical Scientist, Queen's University Belfast) and Dr Joe Houghton, Clinical Senior Lecturer (Queen's University Belfast)

POSTGRADUATE QUIZ

1. A stack of radio-opaque stones is visible in the distal left ureter.
2. This can be a complication of Electronic Shock Wave Lithotripsy (ESWL), a common treatment for renal calculi. ESWL is a non-invasive method that utilises auditory waves to break up a calculus with minimal collateral damage. Steinstrasse may also occur spontaneously due to multiple ureteric stones.
3. This sign is known as "Steinstrasse", a term derived from the German for "stone street." Steinstrasse is a common complication of ESWL, with a reported incidence of as high as 8%. The risk is related to the size of the original stone and its anatomical site. It is caused when fragments of a broken calculus become lodged in the ureter causing obstruction and hydronephrosis. Patients normally present with pain and discomfort, or in more severe cases, obstructive pyelonephritis and urosepsis. Treatment can be either conservative, further ESWL or surgical (with procedures such as percutaneous nephrolithotomy, ureteroscopy or open surgery), depending on severity and anatomical position. In order to minimise the risk of developing Steinstrasse after ESWL, patients are encouraged to increase fluid intake and be physically active. Adequate follow-up post-ESWL allows Steinstrasse to be identified and treated early.



Michael Corr (Medical Student, Queen's University Belfast) and Dr Ian Bickle (Consultant Radiologist, Raja Isteri Penigran Anak Saleha Hospital, Bandar seri Begawan, Brunei Darussalam). Curiositas would like to thank Mr Roger Bickle for his image of the cobbled street.

AND FINALLY...

1. This is a case of pseudohyperkalaemia, i.e. the true serum potassium concentration is normal despite an apparently elevated level reported by the laboratory. In this case, the man's fragile leukaemic cells have released potassium in those samples delivered to the laboratory using the pneumatic tube system (samples A and B), presumably due to vibration and pressure changes. For samples delivered to the laboratory by the hospital porters (C and D), the potassium concentration is normal.
2. Pseudohyperkalaemia can occur with: haemolysis, delayed processing of blood, very high white cell or platelet counts, potassium contamination and abnormal red blood cells. In leukaemia, the disease sub-type, degree of leucocytosis, type of blood tube and manner of transport to the laboratory may all be factors¹.
3. If pseudohyperkalaemia is suspected, blood should be collected carefully into both clotted and lithium heparin tubes, and transported to the laboratory manually as soon as possible. Alternatively, a point of care device might be available (e.g. a blood gas analyser with a potassium facility).

1) Dastyh M and Čermáková Z. Pseudohyperkalaemia in leukaemic patients: the effect of test tube type and form of transport to the laboratory. *Ann Clin Biochem.* 2013. 51(1) 110-113.

Dr Paul Hamilton (Specialty Registrar, Chemical Pathology, Belfast Health and Social Care Trust)