

Questions and Answers in OTOLARYNGOLOGY

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WRIGHT

London Boston
Durban Singapore Sydney Toronto Wellington

John Wright

is an imprint of Butterworth Scientific

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First published 1988

© Butterworth & Co. (Publishers) Ltd, 1988

Borough Green, Sevenoaks, Kent TN15 8PH, England

British Library Cataloguing in Publication Data

Hawthorne, Maurice

Questions & answers in otolaryngology.

I. Otolaryngology—Examinations, questions, etc.

I. Title II. Bingham, Brian J.G.

616.2 '2 '0076 RES7

ISBN 0-7236-0527-0

Photoset by BC Typesetting

Whitehall House, Gordon Road, Whitehall, Bristol BS5 7DL

Printed and bound by Robert Hartnoll (1985) Ltd, Bodmin, Cornwall

Foreword

It is a privilege to have been granted a preview of this fascinating collection of Questions and Answers in Otolaryngology.

They include a wide range of topics, some of them peripheral to the mainstream of Otolaryngology and including a number of littleknown conditions and techniques.

Inevitably, in a book of this type, the answers are dogmatic and sometimes contentious, and this is 'medicine' to be taken in small doses; but the format ensures that the reader's interest is maintained from first to last, and the authors are to be congratulated on an excellent idea, finely executed.

It will be of particular value to candidates studying for higher qualifications, but no-one engaged in the specialty could fail to learn a great deal from it.

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Preface

This book is the product of postgraduate tutorials, meetings and seminars attended by the authors. The information is now presented in a question-answer format in this small pocket-sized book to aid others in their examination revision.

Such a book cannot be comprehensive; however, it is hoped that the reader, through its use, will identify areas of weakness in his knowledge. Some answers are inevitably dogmatic for it is beyond the scope of such a work to enter into discussion. This text should help the candidate provide safe, clear and reasonable answers on a wide range of topics. The book is laid out in five sections, Basic Sciences, Rhinology, Head and Neck Surgery, Otology, and Operative Surgery. This format will help a candidate to concentrate on any areas of weakness and save him the trouble of searching the book for questions on a particular field. The book is indexed to help identify questions on particular topics.

We have attempted to conform to the mainstream of current medical thinking in the answers given. Many of the questions are referenced to specific pages in two very useful revision textbooks, which are listed at the end of the book. It is inevitable that some statements are contentious but to minimise this each section has been reviewed. We are most grateful to Mr Mansell Griffiths for reviewing the Basic Sciences section, Mr Adrian Drake-Lee (Rhinology), Mr Ivor Donaldson (Head and Neck Surgery), Mr Roger Gray (Otology) and Mr Richard Maw (Operative Surgery). We would also like to thank Mr Philip Bicknell for cheerfully reading the text and for his comments, which helped to achieve an overall balance.

Maurice Hawthorne
Brian Bingham

Glossary

APUD	= amine precursor uptake decarboxylase	Log.	= logarithm
AV	= arterio-venous	MeV	= megavoltage
BPPV	= benign paroxysmal positional vertigo	MRI	= magnetic resonance imaging
CI, C2	= cranial nerve roots 1, 2	NACE	= necrosis with atypical cellular exudate
CSF	= cerebrospinal fluid	PNS	= post nasal space
CSOM	= chronic suppurative otitis media	PO ₂	= partial pressure of oxygen
CT	= computerized tomography	PTFE	= polytetrafluoroethylene
CVP	= central venous pressure	REM	= rapid eye movement
CXR	= chest radiograph	SLE	= systemic lupus erythematosus
DTPA	= diethylene triamine pentaacetic acid	SMR	= submucous resection of the septum
ECG	= electrocardiogram	T3	= tri-iodothyronine
EEG	= electroencephalogram	T4	= thyroxine
EMG	= electromyography	TB	= tuberculosis
ENG	= electronystagmography	TIBC	= total iron binding capacity
ENT	= ear, nose & throat	TMJ	= temporomandibular joint
ESR	= erythrocyte sedimentation rate	TSH	= thyroid stimulating hormone
ET	= endotracheal	URT(I)	= upper respiratory tract (infection)
FBC	= full blood count	Vit.	= vitamin
HIV	= human immunodeficiency virus	VMA	= vanillylmandelic acid
HLA	= human leucocyte antigen		
I, II, ...	= cranial nerves		
IDL	= indirect laryngoscopy		
IgA, G, E	= immunoglobulin A, G, E		
IM, IV	= intramuscular, intravenous		

SI units are used in the text.

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- Q1. Describe the sensory nerve supply to the external ear.
- Q2. Define vestibular nystagmus.
- Q3. Laser is an acronym of what?
- Q4. Summarise the causes of late development of speech.
- Q5. Describe the origin of the five waves usually found on brain stem evoked response audiometry.
- Q6. The anterior wall of the tympanic cavity has four openings. What are they?
- Q7. What is the causative organism of lupus vulgaris?

A1. The pinna is supplied by the greater auricular (C2 and 3) and lesser occipital nerves (C2). The anterior part of the meatus is supplied by the auriculotemporal branch of the trigeminal. The posterior part of the meatus is supplied by the auricular branch of the vagus. (Ref.1 P9.)

A2. Vestibular nystagmus is a rhythmical eye movement. It usually has two components, a slow labyrinthine component and a quick corrective cerebral component. The nystagmus is named according to the direction of the quick component.

A3. Light Amplification by Stimulated Emission of Radiation.

A4. a) Familial feature. b) Mental subnormality.
c) Deafness. d) Autism.
e) Twins. f) Inexplicable delay.
g) Environmental factors. Lack of verbal stimulation.

A5. First wave is generated by first order cochlear nerve fibres. Second wave is generated by the cochlear nucleus. Third wave is generated in the superior olivary nucleus. Fourth and fifth waves arise in the inferior colliculus. (Ref.1 P56.)

A6. a) The canal of Huguier (medial end of the petrotympanic fissure) through which the chorda tympani passes.
b) The canal for the tensor tympani muscle.
c) The tympanic orifice of the Eustachian tube.
d) The petrotympanic fissure (Glasserian fissure) containing the tympanic artery and the anterior ligament of the malleus. (Ref.1 P10.)

A7. Mycobacterium tuberculosis.

Q8. Describe the development of the ethmoid sinuses.

Q9. Describe the circulation of cerebrospinal fluid.

Q10. What is Cheyne-Stokes breathing?

Q11. Define the term 'cyst'.

Q12. Define the term 'dystrophic calcification'.

A8. All the paranasal sinuses develop as extrusions of mucous membrane from the nasal fossae and begin to appear about the fourth month of foetal life. Two or three ethmoidal air cells are present at birth and during childhood more cells are formed in the surrounding developing bone. (Ref.1 P149.)

A9. CSF is secreted mainly from the choroid plexus in the lateral ventricles and passes via the interventricular foramen (Munro) into the third ventricle; then down the aqueduct (Sylvius) to the fourth ventricle from there into the cisterna magna via the median foramen (Magendie) and the lateral foramen (Luschka). From the cisterna some fluid passes into the spinal subarachnoid space but most passes up through the cisterna ambiens into the cerebral subarachnoid space. Absorption is into the sagittal sinus by way of the arachnoid villi. A small amount of CSF is produced and absorbed throughout the above route particularly around blood vessels. (Ref.1 P458.)

A10. A series of breaths of increasing depth and frequency followed by a period of apnoea which may last up to a minute until reaccumulation of carbon dioxide reaches a level which stimulates the failing respiratory centre.

A11. The term 'cyst' means a space containing fluid and lined by epithelial cells. The epithelial lining is not neoplastic.

A12. This is calcification of soft tissues without any general disturbance of calcium metabolism. An example of this is tympanosclerosis.

Q13. What is the nerve supply of the parotid gland?

Q14. Describe the boundaries of the infratemporal fossa.

Q15. What is a Type 1 hypersensitivity reaction?

A13. Postganglionic secretomotor fibres from the otic ganglion reach the gland by travelling along with the auriculotemporal nerve. The preganglionic fibres arise from the cell bodies in the inferior salivatory nucleus of the medulla. They travel by way of the IXth cranial nerve, its tympanic branch, the tympanic plexus and the lesser petrosal nerve to the otic ganglion. Sympathetic fibres reach the gland from the superior cervical ganglion via the external carotid and the middle meningeal arteries. A sensory supply to the gland is derived from the auriculotemporal nerve; however, the parotid fascia receives its sensory innervation from the greater auricular nerve (C2).

A14. This space is bounded anteriorly by the posterior wall of the maxilla and posteriorly by the styloid apparatus and the carotid sheath. Superiorly is the squamous temporal bone and the greater wing of the sphenoid while medially is the side wall of the pharynx and laterally the ascending ramus of the mandible. It has no anatomical floor but continues downwards through the tissue spaces of the neck. The space is continuous with the superior and posterior mediastinum.

A15. Type 1 reactions occur in individuals with increased amounts of IgE class antibodies developed in response to antigenic stimuli. Mast cells bound with this IgE antibody degranulate in response to an antigen trigger which gives rise to a local inflammatory reaction, smooth muscle spasm, or to a more generalised reaction. Examples include hayfever, and anaphylaxis.

Q16. Describe the nerve supply of the derivatives of the third pharyngeal arch.

Q17. Describe the ossification of the sphenoid bone.

Q18. Outline the embryological development of the ossicles.

Q19. What is the normal CSF pressure in a patient lying in the lateral position, relaxed and breathing easily?

Q20. What is Queckenstedt's test?

Q21. What is a positive Queckenstedt's test indicative of?

A16. The glossopharyngeal is the nerve of the third pharyngeal arch. It supplies the mucous membrane of the posterior third of the tongue and the oropharynx which are derived from the endoderm of the third arch. The stylopharyngeus muscle, also supplied by the IXth nerve, is derived from the mesoderm of the arch. The internal carotid artery is the persistent third arch artery. The IXth nerve supplies its dilatation, the carotid sinus and the adjacent carotid body, all developed from the third arch mesoderm.

A17. The floors of the middle and posterior cranial fossae ossify in cartilage. Bone superior and inferior to this, eg. the cranium and face, ossify in membrane. Consequently the body, lesser wing and base of the greater wing ossify in cartilage. The remainder of the greater wing and the pterygoid plates ossify in membrane. The centres appear at the end of the second month.

A18. The head of the malleus and the body of the incus are derived from the mesoderm of the first visceral arch whereas the stapes superstructure, long process of the incus, and the malleus handle are derived from the mesoderm of the second arch. The stapes footplate is part of the otic capsule arising in the mesoderm surrounding the membranous labyrinth. (Ref.2 Pl07.)

A19. Between 60 and 180mm of CSF.

A20. Queckenstedt's test is performed during a lumbar puncture. The jugular veins are compressed, first separately then both, while the CSF pressure is observed. It is seen to rise during compression. This is a negative result.

A21. A positive test indicates a block in the dynamic circulation of CSF, an occluded jugular vein, an incorrectly placed or blocked needle.

Q22. Describe the course of the vestibular nerve.

Q23. Describe the embryological development of the inner ear.

Q24. Classify mastoid aeration.

A22. First order neurones arising from the superior and lateral semicircular canal ampullae and the utricle emerge from the fundus of the internal acoustic meatus above the horizontal crest. First order neurones arising from the neuroepithelium of the saccule emerge into the fundus of the internal acoustic meatus below the horizontal crest. Alongside these fibres emerge the fibres arising from the ampulla of the posterior semicircular canal from the foramen singulare. When these fibres have pierced the dura and arachnoid mater the formed superior and inferior vestibular nerves lie within the internal acoustic canal and are here distended into the vestibular ganglia by the cell bodies. The central processes of these first order neurones combine into the vestibular nerve which then joins the cochlear nerve and passes into the cisterna pontis. The vestibular fibres relay into the vestibular nucleus which is situated in the lateral angle of the fourth ventricle in both pons and medulla. This nucleus sends fibres to the archaocerebellum and to the motor nuclei of the brain stem via the medial longitudinal bundle. The vestibulospinal tracts descend to the anterior horn cells of the spinal cord. There appears to be cortical connections with the vestibular nucleus via the medial geniculate body to the region of the auditory centre.

A23. Ectoderm in the region of the hind brain invaginates to form the auditory pit. The auditory vesicle originates from this pit by 'pinching off' of the ectoderm at the neck of the pit. The mesoderm surrounding it becomes the cartilagenous ear capsule which finally ossifies to form the bony labyrinth. (Ref.1 P4.)

A24. a) Cellular, with large numerous air cells.
 b) Diploic, with small air cells and marrow spaces.
 c) Sclerotic (ivory), where there are no marrow spaces or air cells. (Ref.1 P6.)