The Role of MRI in the Assessment of Peripheral and Maxillo-Facial Soft Tissue Vascular Anomalies

Essay

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By

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List of Abbreviations

Abbreviation	Stands for
3D	Three dimensional
4D TRAK	Four dimensiomal time-resolved MR angiography with keyhole
APA	Ascending pharyngeal artery
ASL	Arterial spin labeling
AT	Anterior tibial
AVF	Arteriovenous fistula
AVM	Arteriovenous malformations
BCA	Braciocephalic artery
CFA	Common femoral artery
CIA	Common iliac arteries
CLVM	Capillary, lymphatic and venous malformations
CM	Capillary malformations
CT	Computed tomography
CVM	Capillary and venous malformations
EJV	External jugular vein
FAC	Facial artery
FOV	Field of view
GLUT 1	Glucose 1 transporter protein
GRE	Gradient Echo
IJV	Internal jugular vein
IPS	Inferior petrosal sinus
ISSVA	International Society for the Study of Vascular Anomalies
LCAA	Left common carotid artery

LIN	Lingual artery
LM	Lymphatic malformations
LSUB	Left subclavian artery
LSV	Long saphenous vein
MR	Magnetic Resonance
NICH	Non-involuting congenital haemangioma
OCC	Occipital artery
PAA	Posterior auricular artery
PICH	Partially involuting congenital haemangioma
PT	Posterior tibial
PVP	Pterygopalatine venous plexus
RICH	Rapidly involuting congenital haemangioma
SA	Subclavian artery
SE	Spin Echo
SFA	Superficial femoral artery
SSFP	Steady state free precession
SSV	Short saphenous vein
STIR	Short inversion recovery
SUT	Superior thyroid artery
TOF	Time of flight
US	Ultrasound
VEGF	Vascular endothelial growth factor
VM	Venous malformations

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Introduction

Introduction

Vascular malformations and tumors comprise a wide, heterogeneous spectrum of lesions that involve all parts of the body and can cause significant morbidity and even mortality in both adults and children ***(Navarro et al., 2009)***.

In the past, approaching vascular anomalies has been obscured by considerable confusion due to use of an unclear nomenclature. The term hemangioma has been applied generically to vascular lesions of differing cause and clinical behavior ***(Hassanein et al., 2011).***

Occasionally, confusion about terminology and imaging guidelines continues to be responsible for improper diagnosis and subsequent treatment. Since treatment strategy depends on the type of malformation, correct diagnosis and classification of a vascular anomaly are crucial ***(Mulliken et al., 2003).***

Typically, the diagnosis of vascular anomalies is made clinically. However, imaging is used to clarify difficult cases and aid in the planning of potential endovascular or surgical intervention. The choice of imaging modality varies based on

the clinical scenario and specific lesion; the three main noninvasive imaging modalities used are ultrasonography (US) and doppler, magnetic resonance (MR) imaging, and computed tomography (CT) ***(Flors et al., 2011).***

Doppler US is the easiest way to assess the haemodynamics of a vascular lesion and to clarify a doubtful diagnosis between a hemangioma and vascular malformation. MRI is the best technique for evaluating the extent of the lesions and their relationship to adjacent structures ***(Dubois, 2010)***.

Magnetic resonance (MR) imaging in combination with MR angiography performed with intravenous administration of gadolinium-based contrast material has an important role in evaluating the extent of lesions, particularly deeper lesions, and their relationship to adjacent structures. The recently introduced three-dimensional (3D) dynamic time-resolved MR angiography technique provides valuable information about the hemodynamics of vascular lesions; thus, MR imaging also aids in diagnosis and classification in clinically uncertain cases ***(Restrepo, 2013).***

Over the past two decades, various subspecialists have adopted a new classification system proposed by the

International Society for the Study of Vascular Anomalies (ISSVA), which divides vascular anomalies into 2 main categories: neoplasms and malformations ***(Kollipara et al., 2013).***

Vascular malformations are classified into slow-flow malformations, including capillary malformations (CM), venous malformations (VM), lymphatic malformations (LM), capillary and venous malformations (CVM), capillary lymphatic and venous malformations (CLVM), and high-flow malformations including arteriovenous fistula (AVF) and arteriovenous malformations (AVM) (**Dubois, 2010).**

Aim of the Work