

Scope of VFSS

Indications + contraindications for VFSS

history taking in the MDT



Courtesy of the Asklepios Stadtklinik Bad Tölz

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Scope of VFSS

The videofluoroscopic swallow study (VFSS) or modified barium swallow study (MBSS) was first described in detail by Jeri Logemann in 1983.

- Modification of the traditional "barium swallow"
 - Classical examination of the gastrointestinal passage not suitable for the examination of oropharyngeal swallowing functions due to examination position and method of bolus application as well as type of contrast agent used [ASHA 1992]

Scope of VFSS

- The examination is to be performed with at least 30 pulses per second (pps)
- Different quantities and consistencies need to be examined
- Evaluation of compensatory therapeutic strategies
- Tandem examination (SLP and radiology)-> collaboration between radiologist and SLP assures optimized performance of the VFSS and best care for the patient
- Recording of the films (depending on the video standard at 25 or 30 frames per second)
- Subsequent frame-by-frame analysis is an integral part of the VFSS

[Logemann 1998, Martin-Harris et al. 2020]

Videofluoroscopic films show the following structures:

- Nasopharynx
- Oral cavity
- Oropharynx
- Hypopharynx
- Larynx
- Upper Trachea
- PES
- Upper esophagus



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Technical:

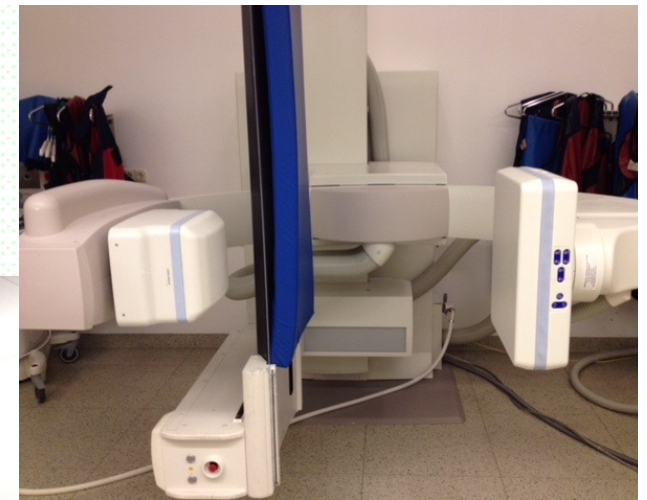
- X-ray machine, eg. Axiom Artis
- Monitor
- Storage medium with the possibility of frame-by-frame analysis

Personnel:

- Radiologist
- SLP

Positioning of the patient

- Seated
 - mobile patient -> sitting on seat/ foot board
 - Seated in wheelchair
- In bed
 - Upright seated in bed



Scope of VFSS

Aims of the study:

- Identification of normal or pathological morphology and biomechanics
- Description of dysphagia:
 - Description of dysphagic symptoms depending on bolus consistencies and quantities
 - Effectiveness of spontaneous cleaning functions
 - Analysis of the underlying pathobiomechanics
- Identification and evaluation of suitable compensatory therapy procedures with the aim of safer and/or more efficient swallowing

[Martin-Harris et al. 2020]

Scope of VFSS

Aims of the study:

- Determine recommendations regarding:
 - Diet:
 - Which diet is safely/ efficiently possible?
 - Maneuvers/ posture changes or other compensation helpful?
 - Swallowing therapy indicated?
 - If so, what content?
 - Further recommendation

It is not primarily important to find out if the patient aspirates, but to understand which underlying pathomechanism causes the swallowing problem so that disorder-specific therapy planning can be implemented

[Martin-Harris et al. 2020, Logemann 1998]

Scope of VFSS

Responsibility of SLP includes:

- correct positioning of patient
- application of the bolus
- adaptation/ modification of the bolus
- assessing efficiency and safety of swallowing
- identifying the symptoms
- evaluate suitable compensatory strategies
- analysis of the underlying pathomechanism in the context of the subsequent frame-by-frame viewing
- Disorder-specific therapy planning

[Logemann, 1993, ASHA 1992, Daniels & Easterling 2017, Martin-Harris et al. 2020]

Scope of VFSS

Responsibility of radiologist includes:

- execution of the X-ray examination
- assessment of morphological-anatomical conditions
 - e.g.: changes in the cervical spine, space-occupying processes, degenerative changes, fistulas, diverticula
- All aspects of radiation protection
 - Here, SLP and radiology should jointly focus in particular on the **ALARA (as low as reasonable achievable)** principle – the protection of examiners and patients from unnecessary radiation must be guaranteed, but the examination must not be completed until sufficient information has been collected to identify the underlying pathomechanism.
- Medical responsibility during the examination

[Logemann 1993, Daniels & Easterling 2017, Martin-Harris et al. 2020]

Indication

Indication for instrumental dysphagia diagnostics (VFSS or FEES) always results from the clinical swallowing evaluation (CSE):

- In case of suspected aspiration
- In case of suspected disorders of the oral, pharyngeal and/ or esophageal parameters of swallowing
- Planning of disorder-specific therapy
- Evaluation of changes secondary to therapy

CSE

The clinical swallowing exam (CSE) involves the following components:

- Patient interview/ history taking
- Observation of gross motor skills
- Inspection of oral cavity
- Cranial nerve exam
- Swallowing exam using multiple textures and volumes

CSE Patient RU

Neurological inhouse rehab 08/2024:

Medical Diagnosis:

- Right medulla oblongata Ischemia 09/2023 (Wallenberg syndrome)
- Respiratory insufficiency requiring intubation secondary to subdural hematoma left hemisphere after fall with craniotomy 01/2024 and newly diagnosed sleep apnea syndrome

Interview:

- Pat nil by mouth (PEG) apart from tsp water and tea
- Has undergone pharyngeal e-stim with no effect
- Treatment modalities based on repeated FEES: strengthening exercises, articulation exercises
- Swallow over the right side easier

CSE Patient RU

Gross motor evaluation:

- ambulatory, needs walking frame for longer distances

CN exam:

- Facial sensory deficit right side -> trigeminal sensory deficit
- Rightsided velar weakness during phonation and gag -> LMN glossopharyngeus/ plexus pharyngis
- Hoarse voice and weak cough -> recurrent nerve deficit (FEES based)

Clinical swallow trials:

- Water swallow -> pat. swallows multiple times, coughs and expectorates content

CSE Patient RU

Clinical diagnosis:

„Suspected severe pharyngeal phase dysphagia with post swallow pharyngeal residue secondary to reduced pharyngeal stripping and or opening of PES.“

Indication

Strenghts of VFSS :

- enables simultaneous observation of all swallowing parameters (oral, pharyngeal, esophageal)
- shows intra-swallow processes
- allows observation of the temporal relationship between swallow initiation and bolus position
- Evaluation of effects of compensatory techniques

Indication

Weakness of VFSS:

- Radiation exposure leads to limited time of trials
- Boluses need to be combined with contrast agent – change of taste
- Transport to radiology necessary

Indication VFSS vs FEES

[vgl. Langmore 2000, Logemann 1998, Murray 2006]

Indication	VFSS	FEES
• Assessment of laryngeal anatomy/ function necessary	-	+
• Assessment of pharyngeal anatomy necessary	-	+
• Dysphagia in the context of fatigue	-	+
• Suspicion of limited saliva control	-	+
• Visualization of the pharynx/ larynx for Biofeedback	-	+
• Bedside examination necessary	-	+
• Concerns about radiation	-	+
• Intolerance of contrast agent	-	+

Indication VFSS vs FEES

[vgl. Langmore 2000, Logemann 1998, Murray 2006]

Indication	VFSS	FEES
• Oral parameters to be assessed	+	-
• Signs of pharyngeal disorder	+	-
• Signs of red. PES opening	+	-
• Signs of esophageal problems	+	-
• Chronic dysphagia - therapy planning	+	-
• Pronounced involuntary muscular movements (e.g. myclonia)	+	-
• Bilateral nasal obstacles	+	-

CSE Patient RU

Recommendations:

- VFSS to understand pharyngeal biomechanics, evaluate compensatory techniques and plan treatment
- Continue swallow trials with water/ tea (low pneumonia risk factors)