Clinical Practices / *Klinik Uygulamalar*

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Throat Swab Procedure in Children

Çocuklarda Boğaz Sürüntüsü Örneği Alımı

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Introduction and General Information

Acute tonsillopharyngitis is the most commonly seen infection of the childhood leading to hospital presentations. The agent of the disease is mostly respiratory tract viruses. The most frequent bacterial agent group is Group A streptococcus (GAS), and GAS infections in school-aged children between 5 and 15 years have been reported as 15-30% among all tonsillopharyngitis agents. GAS pharyngitis can be observed in much younger children who are in contact with school-aged children. *Corynebacterium diphtheriae*, *Neisseria gonorrhoeae*, *Arcanobacterium haemolyticum* and anaerobe bacteria may also cause tonsillopharyngitis. While *A. haemolyticum* is a rare agent, it is substantial since it may lead to dengue-like rashes. Following the consumption of unpasteurized cow milk, Group C streptococcus may also be an agent of pharyngitis.

Although there are some clues in terms of tonsillopharyngitis etiology, it is not always possible to differentiate between viral and bacterial tonsillitis on just the basis of clinical findings. Therefore, it may be necessary to use laboratory diagnostic tests in select cases.

Diagnosis of Bacterial Tonsillopharyngitis

In order to detect *Streptococcus pyogenes*, direct diagnostic tests and bacteria culture can be performed on the throat swab sample.

Sample Taking

Pre-procedure

- Prepare the tongue depressor and sterile culture tube with swab (Figure 1).
- Perform hand hygiene.
- It is recommended to wear a surgical mask and gloves during the procedure, when necessary.

Preparing the Patient

- Prefer a well-lit room.
- Stand right in front of the patient.
- Make sure that the patient is in a comfortable position in front of the light source.
- Be careful with the tip of the sample strip not to touch anywhere besides the tonsillar region.

Removing the Swab

- Remove the swab from its protective package.
- Hold the strip firmly from its handle grip.
- Do not place the cotton strip on any surface after removing it from its protective package.

Taking the Sample

- Tell the patient to open his/her mouth as widely as possible and say "ahh".
- Direct the tip of the swab towards the tonsillar region.

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Table 1. Laboratory diagnosis in tonsillopharyngitis

Etiological agent	Diagnostic procedure	Sample	Transportation
Bacterial			
Streptococcus pyogenes	Rapid antigen test (if the test is negative, then throat culture/NAAT)	Two pharyngeal swabs	Swab transportation tool, RT, <2h
	NAAT	Pharyngeal swab	Swab transportation tool, RT, <2h
	Nucleic acid probe test s	Pharyngeal swab	Stabilized as specified by the firm, Swab transportation tool, RT, <2h (if culture will be performed)
Group C and G β hemolitic streptococci	Throat culture and antigen tests (fro group C and G streptococci)	Pharyngeal swab	Swab transportation tool, RT, <2h
	NAAT	As specified by the company	
Arcanobacterium haemolyticum	Throat culture for *A. haemolyticum*	Pharyngeal swab	Swab transportation tool, RT, <2h
Neisseria gonorrhoeae	Throat culture or NAAT for *N. gonorrhea*	Pharyngeal swab	Swab transportation tool, RT, <2h
Corynebacterium diphtheriae	Methylene blue dye for *C. diphtheriae* culture	Psoeudomembrane	Sterilized container, RT, <2h
Fusobacterium necrophorum	Anaerobe incubation Selectibe growth medium	Pharyngeal swab	Anaerobe swab transportation tool, RT, <2h
Viral			
EBV	Monospot test EBV serolgy	5 ml serum	Clot tube, RT, <2h or <24 h in the fridge
HSV (tip 1)	Direct identification test Culture	Swab from the pharyngeal lesion	Swab transportation tool, RT, <2h
	HSV IgG, IgM serology	5 ml serum	Clot tube, RT, <2h or <24 h in the fridge
CMV	CMV IGM serology	5 ml serum	Clot tube, RT, <2h or <24 h in the fridge

CMV: Sytomegalovirus, EBV: Epstein-Barr virus, HSV: Herpes simplex virus, IgG: Immunglobulin G, IgM: Immunglobulin M, NAAT: Nucleic acid amplification test, RT: Room temperature.

Figure 1. Culture tube with tongue depresssor amd sterile swab (mediated and dry type).

- Do not touch any part of the mouth including the tongue.
- After pressing on the tongue with the tongue depressor, take the sample without contacting the saliva by rubbing the swab onto both tonsils and the posterior pharynx (Figure 2).
- Remove the strip from the mouth avoiding contact with any surface.

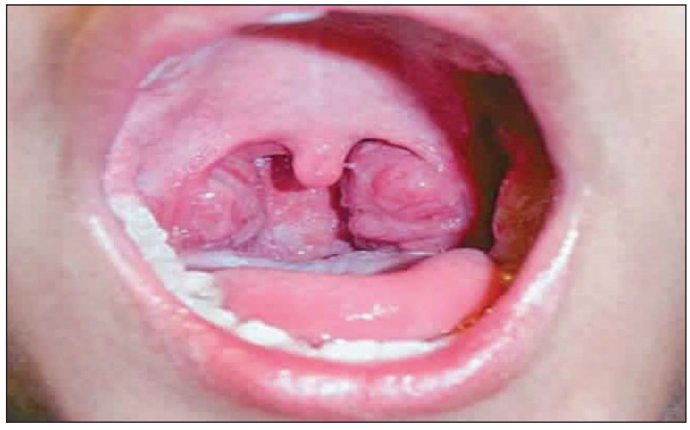

Figure 2. Posterior oropharyngeal view.

Post-procedure;

- Using the aseptic technique, place the swab into the sterile tube.

- Label the name and date of birth of the patient with the source and sample date on the tube.
- Culture inoculation of the sample must be performed within two hours. If not, the sample must be placed in the sample transport medium.

Rapid Antigen Test

Rapid antigen tests (RAT) for Group A streptococci are based on the extraction of the enzyme or acid of the antigen from the throat swab sample. Its specifity and sensitivity are ≥ 95% and 70-90%, respectively. When high specifity and limited sensitivity of current tests are considered, positive RAT is useful in diagnosing GAS pharyngitis; however, a negative test does not eliminate GAS, and children and adolescents with RAT negativity must also undergo throat culture test.

Throat Culture

Throat culture, if applied correctly, has a specifity around 90-95% in diagnosing GAS pharyngitis. False negativity never exceeds 10% if culture is taken with the appropriate method and appropriate microbiological tests are performed in appropriate growth media in symptomatic cases. Pharyngeal isolation of Group A streptococcus does not differentiate the person with real streptococcal infection from the carriers of concurrent viral streptococcus.

Throat culture is usually performed in a 5% sheep blood agar. The culture is positive if the small gray colonies that have a surrounding beta hemolysis field are detected following an 18-24 h incubation at 35-37°C. Cultures that result negative in the first 24 hours must be cultured for another 24 hours to maximize GAS growth. Throat culture can also identify Group C and Group G streptococci and other bacteria like *Arcanobacterium haemolyticum* that much rarely cause pharyngitis.

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