COVID-19 and ENT Pediatric Otolaryngology during the COVID-19 pandemic: guidelines of the French Pediatric Otolaryngolocial Society (AFOP) and French Society of Otorhinolaryngology (SFORL).

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Abstract

Objective: Joint guidelines of the French Pediatric Otolaryngology Society (AFOP) and of the French Society of Otorhinolaryngology – Head and Neck Surgery (SFORL) on the management of pediatric otolaryngology patients in the context of the COVID-19 pandemic, local recommendations and scientific literature. Proposals may have to be updated on a day-to-day basis.

Results: In children, the incidence of symptomatic COVID-19 is low (1-5%) and of good prognosis. The indications for nasal flexible endoscopy should be drastically limited. If undertaken, full Personal Protective Equipment (PPE) including FFP2 masks is required, as well as the use of a sheath. Saline nose wash done by caregivers other than parents at home should require PPE. Unless foreign body tracheobronchial aspiration is clinically obvious, a CT-scan should be performed to confirm the indication of endoscopy. Surgical indications should be limited to emergencies and cases that cannot be delayed beyond 2 months (especially endonasal, endopharyngeal and laryngo-tracheobronchial procedures). Postponement should ideally be a group decision and recorded as such in the medical file. Surgical techniques should be adapted to limit the risk of viral dissemination in the air, avoiding the use of drills, microdebriders, monopolar cautery or lasers. Continuous suction should be placed near the operating field. In case of confirmed Covid-19 cases or suspected cases (or in some centers systematically), PPE with FFP2 mask should be worn by anybody who is in the operating room.

Keywords: pediatric; ent; otolaryngology, covid-19, coronavirus, pandemic

Key messages

Low incidence of symptomatic pediatric cases (1-5% in international series)

Most cases are asymptomatic or paucisymptomatic; exceptionally severe, especially in the youngest patients; good prognosis

Hygienic precautions are particularly important to watch out for in young children who have not yet acquired acceptable personal hygiene

Nasal endoscopy requires the same precautions as with adults, in particular: the need to drastically reduce indications and to wear Personal Protective Equipment (PPE) such as a FFP2 mask, an overcoat, protective glasses, a cap, gloves, the use of a camera (to increase distance) and if possible an endoscopic sheath. The endoscope should be carefully cleaned entirely after removal of the sheath, as well as the surrounding surfaces. An alternative to the use of sheaths is the systematic decontamination of the endoscope according to the usual procedure after each use.

Saline nose wash: they are only indicated in disabling nasal obstructions, especially in infants; in which case no specific precautions are necessary when they are carried out at home by the parents; at the hospital, in order to prevent contamination of caregivers, it is however advisable to wear full PPE.

Indications for tracheobronchial endoscopy under general anesthesia for suspected aspirated foreign bodies should be reduced to clinically obvious cases. In other less obvious situations, the indication should be guided by a CT-scan showing direct or indirect signs in favour of foreign body aspiration.

Surgical indications should be limited to emergencies and cases that cannot be delayed beyond 2 months. Postponement should ideally be a group decision and recorded as such in the medical file (possible help from Ethics Committees, ie French National ENT Ethics Committee: ceorl@sforl.org).

Surgical techniques should be adapted to limit the risk of viral dissemination in the air: for endonasal surgery, avoid drills and microdebriders and prefer external approaches to drain orbital abscesses in ethmoiditis; mastoidectomies should be performed without drills, using other instruments (hammer, gouge, curette); a continuous suction should be placed near the operating field; monopolar cautery and laser may also be at increased risk.

Caregiver protection during surgery: in case of confirmed Covid-19 cases or suspected cases (or in some centers systematically), PPE with FFP2 mask should be worn by anybody who is in the operating room.

Introduction:

The authors present the joint guidelines of the French Pediatric Otolaryngology Society (Association Française d'ORL Pédiatrique – AFOP, www.afop.fr) and of the French Society of Otorhinolaryngology – Head and Neck Surgery (Société Française d'Oto-Rhino-Laryngologie et de Chirurgie de la Face et du Cou – SFORL, www.sforl.org) on the management of pediatric otolaryngology patients in the context of the COVID-19 pandemic. In this document, Covid+ is used to refer to patients infected by SARS-CoV-2.

Materials and Methods:

A nationwide work group was entrusted with a review of the scientific literature on the above topic. Guidelines were drawn up, based on clinical experience, nationwide or local

recommendations, those of other scientific societies and clinical studies in progress. Given the rapid evolution of the worldwide pandemic and the daily updates in the scientific literature, the following proposals may have to be updated on a day-to-day basis.

Results:

Specifics concerning SARS-CoV-2 in children

An update on this subject written by INFOVAC-FRANCE is available at the following address: https://www.infovac.fr/actualites/bulletin-supplementaire-22-mars-2020-mise-au-point-sur-le-covid-19-en-pediatrie

Prevalence of SARS-CoV-2 infection in child

Cases are much rarer than in adults:

Chinese series of 44,672 confirmed cases: 2% of patients under 19 years of age and 0.9% under 10 years of age [1].

Korean series: 4.8% of patients under 19 years of age and among them, only 15.9% under the age of 9 [2].

In Italy, out of 22,000 confirmed cases: 1.2% of patients under the age of 18 [3].

In the United States, out of 4000 confirmed cases: 5% of children [4].

The infection may occur at any age: median age of 7 years old [5–7].

Transmission/contagiousness

As in adults, direct, human-to-human transmission, via the projection of droplets, by hand contact or via an inert surface.

The virus is viable for up to several days on certain surfaces (plastic 72 hours and stainless steel 48 hours): young children tend to touch everything and it is advisable to regularly disinfect all surfaces in offices and consultation rooms, as well as hospital rooms for children. Conventional disinfection methods are effective [8].

Stools are potentially contaminating: young children do not have the hygienic reflexes of an adult, thus it is recommended to clean all the surfaces having potentially been in contact with the child (bowl rim, flush button, door handle, etc.) after toilet use. Although viral RNA has been found in the stool, no oro-fecal transmission has been documented [9,10].

No case has been described of materno-foetal transmission of the virus in pregnant women infected with SARS-CoV-2 [11,12].

Incubation time in children: 2 to 10 days [13].

Duration of contagiousness: there is no specific pediatric data. In adults, the median duration of presence of viral RNA in upper respiratory secretions is 10.5 days (6-12 days) [14] and it is usual practice to quarantine subjects for 15 days . The same attitude is recommended in a Covid-19 positive child.

Symptoms, prognosis, diagnostic tests

Suggestive symptoms are the following: fever, dry cough, headache, myalgia, digestive disorders, acute anosmia without nasal obstruction, acute dysgeusia, but also infectious ENT complications such as mastoiditis, rhino-sinusitis, cervical or peripharyngeal collections. Unilateral facial paralysis could be an associated sign. It is recommended, even in the COVID-19 pandemic context, to treat severe forms of acute facial paralysis (grades 5 or 6 of the House - Brackmann classification) with short-term oral corticosteroid therapy (5 to 7 days) (see up-

to-date dedicated recommendations “Corticothérapie en ORL” on the SFORL website https://www.sforl.org/actualites-covid-19/).

According to the Chinese pediatric series [5], prognosis is good as 90% of children were asymptomatic or paucisymptomatic, including only 5.2% with oxygen desaturation and 0.6% with acute respiratory distress.

Younger children appear to be the most likely to develop severe forms. The prevalence of the most severe forms was 10.6% for children of less than 1 year old Covid+ in the same series [5]. The earliest symptomatic case reported is that of a 55-day-old child [15].

Good prognosis: no deaths of children reported in Italy or China [4–6,16].

Diagnosis:

▪ Possible biological abnormalities on the usual lab workups: lymphopenia, elevated CRP

▪ Sensitivity of RT-PCR on nasopharyngeal samples: no specific pediatric data; but in adults sensitivity of about 60% [17,18].

▪ Chest CT-scan: sensitivity over 90%, the first lesions to appear being pulmonary nodules [18]. The CT-scan was abnormal for all severe forms of SARS-CoV-2 infections in children [19].

Precautions in the clinic

Indications

They are limited to the following cases:

Emergencies

Treatment impossible without clinical examination

Indispensable post-operative care

Ideally, a dedicated room to perform the procedure will be identified, with as little material as possible to facilitate cleaning between each consultation (see up-to-date dedicated recommendations “Rôle du spécialiste ORL dans la situation de crise induite par la pandémie de COVID-19” on the SFORL website https://www.sforl.org/actualites-covid-19/).

Flexible nasal endoscopy Indicated only if necessary because at high risk of viral spreading in the air [14]. Endoscopy should not be performed otherwise, in particular not for airway obstruction diagnosis if it is clinically well tolerated.

It should be performed in the following conditions:

Otolaryngologists should wear full Personal Protective Equipment (PPE): FFP2 mask, overcoat, cap, protective glasses. All of this equipment is thrown into dedicated infected waste bins in the examination room except the glasses which can be decontaminated and reused.

The nasal endoscope is placed on a clearly separate table, if used, the camera should have a protective cover.

A sheath should be used. After removal, thorough cleaning of the entire endoscope, including the proximal areas that have not been in direct contact with the nasal cavity. An alternative to the use of sheaths is the decontamination of the endoscope after each use, following the usual decontamination procedure.

Thorough cleaning of all surface areas of the examination room.

Local anesthesia with spray is not recommended. (For Belgium: local anesthesia/decongestion with placement of soaked cotton)

The following link is a document explaining in detail PPE precautions: https://www.openpediatrics.org/assets/document/donning-and-doffing-personal-protective-equipment-high-resolution-color

Newborn hearing screening

Authorized if practiced by staff not working with patients and if the mother is asymptomatic.

Protection of the tester: surgical mask, surgical hand scrubs before and after each test, gloves taken off after each test, then decontamination of the equipment.

Take care not to lose track of the children who have to be retested after discharge from maternity (establish lists of children who have to be tested again after the crisis is over).

Medical treatment

Saline nasal irrigation:

Should be limited for disabling nasal obstructions, especially in infants

Precautions:

▪ No particular precaution at home because in any case, even in the absence of nasal irrigation, an infected child has a very high risk of contaminating his siblings and his parents.

▪ At the hospital, the risk is to contaminate the staff caregiver. Precautions are therefore advised in this context: wearing a surgical mask, gloves, protective glasses, a gown.

Corticosteroids: indications of corticosteroid therapy in otolaryngology is mentioned in two other SFORL documents (see up-to-date dedicated recommendations "Corticothérapie en ORL" and "Consultations et traitements médicamenteux en rhinologie en contexte d'épidémie Covid-19" on the SFORL website https://www.sforl.org/actualites-covid-19/).

It is possible to treat severe forms of acute facial paralysis (grades 5 and 6 of the House Brackmann classification) and sudden sensorineural hearing loss (only greater than 60 dB) with a short-term corticosteroid therapy.

It is not recommended to use steroids for polyposis, infectious sinusitis or anosmia.

Pediatric otolaryngology surgical procedures

5.1 Indications

Procedures that are strictly impossible to postpone for more than 2 months and for which there is no medical therapeutic alternative are the only ones to be maintained during the pandemic.

In difficult cases (ie: cholesteatoma, tonsil hypertrophy with severe OSAS), the decision should ideally be made as a group with a written decision recorded in the medical file. In private practice, it is possible to seek advice from the Ethics Committee of the Professional ENT National Council (ceorl@sforl.org).

Tonsillectomy and/or adenoidectomy in severe OSAS

Indications should be limited as much as possible, as the salivary secretions, the nasopharynx and probably the tonsil tissues (virus tropism for lymphocytes) have a high viral load.

In case of urgent therapeutic indication: tonsillectomy should be preferred to non-invasive ventilation, the latter being at high risk of viral dissemination in the ambient air and requiring a hospital bed, often in ICU, for several days.

In the absence of data on the subject, it is not recommended to use any particular tonsillectomy technique.

Endonasal surgery

Indications should be strictly limited because of the high viral load in the nasal cavities and the risk of dissemination of viral particles in the ambient air.

Examples of indications which should be maintained: bilateral choanal atresia, congenital piriform aperture stenosis poorly tolerated despite maximum medical treatment.

Tympanic ventilation tubes

Potential presence of the virus in the middle ear effusion is not yet documented.

The procedure is not recommended during the epidemic period as it is considered non-urgent.

Tympanoplasties for retraction pockets and cholesteatomas

Indications should be discussed on a case-by-case basis depending on the extensions and possible complications: meningeal exposure, labyrinthine fistula, facial paralysis.

Postponement is possible in the vast majority of cases.

Airway endoscopies for suspected foreign bodies aspiration

Three situations can be distinguished:

- The foreign body is clinically very strongly suspected (parents witnessed the aspiration of a foreign body, clear penetration syndrome, persistent cough, dyspnea): the indication for tracheobronchial endoscopy is maintained without prior CT-scan.
- Doubt is cast on foreign body aspiration (penetration syndrome without subsequent clinical anomaly or conversely clinically compatible - cough, dyspnea, asymmetric auscultatory abnormalities - but without clear penetration syndrome or any other obvious etiology): chest CT-scan is recommended, after which tracheobronchial endoscopy is performed if the CT-scan reinforces suspicion (visualisation of foreign body; unilateral expiratory trapping; systematized ventilation anomalies); the radiologist should also check the CT-scan for pneumological signs in favor of a Covid-19.
- Case with very little suspicion (no clear penetration syndrome, no suggestive clinical anomalies): no CT-scan or tracheobronchial endoscopy.

Other indications for airway or oesophagus endoscopy which should be maintained:

- Button battery ingestion (oesophagus, nasal cavity)
- Caustic ingestion
- Repeated extubation failure, after discussion with neonatologists or intensive care anesthesists

Tracheostomy

Very few indications should be maintained, and should be discussed on a case-by-case basis due to a high risk of dissemination of viral particles during the procedure and also subsequently during tracheostomy tube changes.

ENT oncological surgery

Few indications exist (see up-to-date dedicated recommendations "Cancérologie ORL et Covid-19: Etat des lieux" on the SFORL website https://www.sforl.org/actualites-covid-19/).

Mastoiditis, complicated sinusitis, cervical or peripharyngeal abscess

Exclusive medical treatment based on intravenous antibiotic therapy guided by bacteriological samples should be preferred as much as possible. Pus should be sampled using nitrous oxide (retro-auricular abscesses in cases of mastoiditis, cervical collections). In case of surgery, external approaches should be preferred to endoscopic procedures when possible (e.g. frontal sinus external drainage procedure or Lynch approach for ethmoiditis).

5.2 Preoperative workup to test for COVID-19

Nasopharyngeal swab with RT-PCR within 48 hours preoperatively:

False negatives: 30 to 40% (see paragraph 1.3)

Indications:

Desirable in all cases

Necessary if suggestive signs of Covid-19 infection are present (see paragraph 1.3)

Waiting for results must not delay urgent procedures such as severe or progressive dyspnea, hemorrhages or severe infections

Thoracic CT-scan:

Sensitivity over 90% (see paragraph 1. 3)

- If a CT-scan is required in the usual preoperative assessment (mastoiditis, complicated sinusitis, cervical or peripharyngeal abscess, tumors), a complementary chest CT-scan must systematically be done.

In other situations: discussion on a case-by-case basis according to age, symptoms and CT-scan availability.

The preoperative diagnosis of Covid-19 infection should induce postponement of non-urgent surgeries of at least 15 days (usual duration of quarantine in infected subjects).

5.3 Surgical cautions

Precautions which should be followed for any procedure and whatever the patient Covid-19 status:

Minimum number of operators in the operating room and particularly near the child's head

Protective glasses, due to the risk of splashes of contaminated biological liquids; these glasses must be decontaminated.

Procedure should be done as fast as possible and performed by an experienced senior surgeon.

Masks:

▪ Always necessary

▪ Depending on the endowments of the centers, either systematically FFP2 (attitude taking into account the high percentages of asymptomatic children and false negative PCR) or use of FFP2 restricted to specific cases, according to symptoms, COVID status and type of surgery (see below).

Confirmed or suspected Covid-19 positive patients (fever, cough, pharyngitis, myalgia, headache, anosmia, sinusitis, mastoiditis, phlegmon): FFP2 mask should be worn by all staff present in the operating room

Additional specific precautions during procedures involving the airways, regardless of the patient's Covid-19 status:

Concerned procedures: intubations/extubations, endoscopy, endonasal surgeries, adenoidectomies/tonsillectomies, but also by extension middle ear surgeries since the latter is lined with respiratory mucosa

Recommended precautions:

▪ FFP2 mask for all staff present in the operating room

▪ If possible, negative pressure operating room, with air filtration/purification to be discussed with the medical officer of health care structure

▪ Techniques favoring the suspension of infected tissue micro-fragments should be avoided as much as possible: drilling, microdebrider and possibly also monopolar electrosurgical unit, laser, radiofrequency tip, coblation probe, microdebrider blade.

▪ When possible, continuous suction should be placed near the operating field.

▪ For certain procedures, in order to limit virus-loaded liquid splashes, specific surgical installations should be considered in addition to the usual draping based on the use of a flexible hoop and transparent sterile drapes (***Figure 1 and 2***).

Figure 1: Example of installation using a hoop for Boyle-Davis suspension to maintain a surgical transparent sterile drape, thus limiting diffusion in the operating room's atmosphere of suspended tissue microfragments loaded with the virus during certain risky ENT procedures (photo from Pediatric Otolaryngology Department, Necker - Sick Children's Hospital, AP-HP, Paris).

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