Sheet no. : 2

Refer to slide no. :

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Infection control in surgical practice

We should know that the possibility for a maxillofacial surgeon to get a disease is much higher than a general dentist, and the surgical operation is the place where many diseases can be transmitted, therefore surgeons must be aware about the cross infection control.

Universally we have 2 important concepts: universal precaution and aseptic technique.

 Universal precaution

It’s all about you need to protect yourself and to consider each patient as infectious patient, its mean that you need to suspect each patient.

To perform surgery the dentist typically violate the oral epithelial surface \* and we know that the epithelial surface is the first line of defense for the body \* when we violate the epithelial surface this mean we establish direct pathway for the microorganisms to get into your body and we also know that **Oral cavity** is the second most contaminated area following the rectum.

Millions of microorganisms can be found in the oral cavity.

(Dentists were blamed for infective endocarditis, patients who have prosthetic heart valve they are more suspected to have endocarditis especially after dental treatment these patients have special way for management we will talk about it in the coming lectures)

New articles say that even when you brush your teeth you will open the area to the microorganisms to get into your blood this mean you must be very careful.

\*Read from the book:

The different types of MO that inhabit the oral cavity (aerobic and anaerobic).

Important note: most of the bacteria in the oral cavity are facultative anaerobic (mainly positive streptococcus).

Universal precaution should be followed by ALL dental **personnel** (dental staff) ALL the times on ALL patients.

All instruments you use must be **sterile**. There is a **big** difference between disinfection and sterilization.

The needle which we use to give the local anesthesia it is for single use we can’t sterilize it and use it again.

Some dentists use the same needle for multiple patients or the same needle for the same patient more than one time this is ***not acceptable, because*** the needle will break after multiple sterilization.

There are a lot of reported accidents for fractured instruments in the patient’s mouth in the buccal mucosa.

Remember never ever insert all the needle’s length when you give local anesthesia, we should insert less than 2/3 of its length.

In major oral surgeries the percent to get injured is much higher than normal dental procedures. Because you are dealing with traumatized tissues and the blood is there.

 **Important** \*\* All body secretions and excretions are potentially infectious except sweat.

\*read from the book:

About the types of bacteria which inhabit the oral cavity, nasal cavity and the adjacent skin.

The most common infections in the oral surgery are caused basically by two types of viruses; **hepatitis** (B and C) and **HIV**.

Hepatitis B

* In Jordan more than 40 % of the population are hepatitis B positive.
* Hepatitis B virus is a strong virus; it’s highly resistant to the chemical disinfectants, to destroy the virus we need to make advance method of sterilization.
* It is the most resistant to sterilization.
* Unfortunately hepatitis B which coexist with hepatitis D are spread by any contact with any type of body secretion .
* Some studies have shown that HBV can be transmitted from the saliva to the acne and the conjunctiva, so to protect yourself you must wear face shield when you work. We must be very careful because minute amount (1\*10-6) of the virus is capable of transmitting the disease.

So if the patient is labeled that he had hepatitis B and the dentist had needle stick injury, the possibility to get the disease is very high in general dentistry and even its extremely high in oral surgery .

 Accordingly, the entrance of a very small blood drop of a hepatitis B patient into the blood circulation of a practitioner can transmit the disease to him.

Note that even if a needle stick injury occurred without any evidence of bleeding you have to report the injury in the cross infection control office and a blood sample must be taken from the patient and the dentist because if the needle had been penetrated the dermis, transmission may occur.

\*All the health care providers should be vaccinated

\*Blood tests should be done for all members of the dental staff to check hepatitis B profile.

\*An immunized person has high percentage of titers/antibodies, while an infected person has a positive hepatitis B surface antigen test.

\* Booster dose should be taken after graduation too.

HIV virus

 Fortunately;

- In Jordan Few people carry HIV virus.

- The amount of the virus which secret in the saliva is very small in comparison to hepatitis B.

- HIV virus loses its infectivity once desiccated while hepatitis B doesn’t.

- HIV infected patients have small amounts of infectious particles.

Notes:

* If needle stick injury happened and the patient have HIV , we should take blood sample from the injured person and give him chemotherapy and special management for prophylaxis in order not to have the disease hopefully.
* The probability of microorganisms to be transmitted through blood is the highest for hepatitis B virus followed by mycobacterium.

**Mycobacterium**

* Similar to hepatitis B, mycobacterium microorganisms are highly resistant to chemical disinfectants and desiccation.
* So methods of sterilization are autoclave, ethylene oxide and radiation.

Refer: HBV is the most resistant to sterilization

* Mycobacterium such as tuberculosis, It’s not easy at all to have TB

But the percentages are coming high, it is already high in the developing countries but another peak is coming to the developed countries.

Why?

* Due to the immune deficiency and HIV percentages which allow other infections to result.

**Aseptic techniques**

Asepsis is defined medically as an attempt to keep the patient, health care staff and objects as free as possible of agents that cause the infection, while it’s defined surgically as an attempt to prevent microbes from gaining access into surgically created walls.

We have :

* Antiseptics
* Disinfectant
* Sterility
* decontamination

we shouldn’t accept anything except sterility

Sterile means zero organisms.

Sterilization is defined as the absolute elimination or destruction of all living organisms while (disinfection, decontamination, antisepsis) defined as methods to decrease or reducing the number of microorganisms.

In dental work, our instruments should be sterile but your approach to the patient is not a sterility approach, its disinfection or decontamination.

It’s difficult to achieve sterility concept, but it is done in major operations.

In major operations we do cleaning to the patient by iodine and the area of surgery. ”everything should be sterile even the towels that used for the patient , and if you are just observer you shouldn’t come close to the sterile field.

**#hand washing:**

Is important for sterility

Wash your hands before and after wearing gloves and between each patients or procedure.

Should be systematic start with nails then go to the dorsum of the hand then backward (there is a full lecture about hand washing)

We have 2 types of gloves:

-**sterile**;

 (Packed and used for major operations), have special way of wearing by sterile/scrubbed nurse.

-**latex** ;

For dental work

In dental work it’s enough to wear latex gloves, scrub/overall gown and have sterile instruments.

**#Methods of sterilization:**

We have to read about the advantages and disadvantages of the autoclave.

We must know that the heat is the basic method for sterilization.

 Sterilization start as (dry heat then steam then steam under pressure which we mean the autoclave)

Physical agents :

* heat
* mechanical dislodgment(all instrument should be washed and cleaned from debris and blood before going to autoclave)
* radiation

chemical agents :

* antiseptics
* disinfectants
* ethylene oxide gas

In the past, they were using solutions (disinfectants) for immersion of instruments but they weren’t followed the instructions

So nowadays, disinfection of dental instruments is unacceptable and the standard goal for sterilization is the autoclave !

And the sensitive instruments for the autoclave we use for the gaseous sterilization.

\*In order to check that the sterilization process is working probably we need to do test for autoclave, so we grow bacillus stearothermophilus bacteria inside (biological indicator).

\*we have to know the combination between temperature and duration.

As you increase the temperature, the time will decrease.

\*you have to differentiate between moist and dry heat:

Moist heat : time is less ,it make denaturation but rusting may happen so it affect the efficiency of instruments over time.

Dry heat: not used nowadays unless in special cases is needed.

Gaseous sterilization ( ethyl oxide )

* Used for the instruments that are heat sensitive or large in size.
* Gauzes and towels are sterilized by gaseous sterilization.
* After the instruments get out from sterilization, it needs 24 hr for aeration because ethyl oxide is toxic gaz.

Different instruments have different ways of sterilization

As we said autoclave is our standard goal but there is different disinfectants you can use them as a **plan B** if any problem happened with the autoclave.

But you should follow the concentration that it should be used for according to the manufacture instructions and immersion hours .

\*The dr showed some tables from the book.

You have to know the brand names of solutions, scientific names , immersion time and biocidal effect :S

Classification of solutions depend on the level of its biocidal effect (high – medium – low)

