Air Polishing

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The concept of air-polishing units is based on a technology developed by Dr. Robert Black in 1945. Black invented a device called the Air Dent, which used compressed air, water and a high-speed air jet to remove caries preparation, making access easier.

While the Air Dent presented many problems, the technology represented the first step in air-polishing devices. Air-polishing units were first introduced in 1976, and from that time forward it became widely available. Air-polishing units are accomplished by inserting an abrasive particle of alumina or sodium bicarbonate through a rotating air stream. The abrasive particle then hits a tooth surface through a handpiece nozzle. The high-speed air jet travels through the handpiece nozzle, through which the air is propelled is actuated with a foot control. The air pressure produces a stream of particles that strike the tooth surface, thus removing stain (Figs. 1a, b).

The air-polishing unit is shown to be effective, safe and effective in removing intrinsic stain and plaque biofilm from tooth surfaces. It is equally effective in decreasing root surface roughness or instrumentation. It is also reported to remove plaque biofilm and staining as effectively as a rubber cup and as less in time². Patients often exhibit extensive stain on root surfaces, specifically on areas of recession and at the cemento-enamel junction. Removing these stains with a brush has been shown to reduce root roughness. However, when stain removal is for aesthetic reasons, the use of an abrasive unit is preferable to the brush. The air-polisher removes stain from structures that are hard to clean in simulated three months for patients who have hypertension and/or coronary artery disease. In addition, patients who have respiratory problems, such as chronic obstructive pulmonary disease or any condition that interferes with breathing or swallowing, should be treated with an alternative approach. Both patients could be compromised by the air-turbine created by air-polishing, and they are also vulnerable to the development of pneumonias.

Contraindications for using the air-polisher also include patients taking potassium, anti-diuretics or oral steroids — all of which can disrupt the acid-base balance. Contraindications for use of the air-polisher also extend to the hard and soft tissues; therefore, the dental history assessment is paramount. Hard tissue that presents with any composite restorations, sealants or glass ionomers should be identified by susceptibility of those materials to surface roughness or pitting.

Porcelain margins and margins of all restorations can be altered by mechanical pressure. The exposure of the air-polishing unit to these areas can lead to loss of marginal integrity, surface roughness, staining and pitfiling. Exposure to these areas should be avoided, because they are not as mineralized as enamel, and are more susceptible to abrasion. In addition, patients who present with active periodontal conditions with soft and spongy tissue are contraindicated because the air-polisher can cause enamel erosion or small blood clots. Lastly, pediatric patients with deciduous teeth or newly erupted deciduous teeth should not be treated with air-polishing.

Patient preparation. It is with utmost importance that before using the air-polishing unit, clinicians must prepare themselves and their patients. Patients preparation would include a thorough explanation of the procedure, review of medical history and taking of blood pressure. The clinician should also provide the patient with safety glasses and confirm retraction of oral tissues. The clinician should make the patient comfortable in a more upright position. A non-patentinbox lubricant should be applied to the patient’s lips to protect them from the abrasive spray, which can dry the lips.

Research has confirmed that when the clinician performs air-polishing procedures, aerosol contaminants can cause surface roughness and pitting.

Air-polishing unit and operator preparation. The clinician should be properly prepared in accordance to the manufacturer’s instructions. Standard proceedures in air-polishing unit and abrasive prodecure, according to patient selection.

The unit and handpiece nominals are prepared according to manufacturer’s directions, and the abrasive compartment is filled with the appropriate abrasive recommended for the material being used (Fig. 3). The unit should be turned on for at least 15 seconds to eliminate air, powder or moisture in the lines. Also, water lines need to be flushed before use, and the appropriate size of water delivery is important. When the unit’s handle is being filled with abrasive powder, the unit must be turned off. It needs to be filled properly and does not fill to the top of the center tube. The clinician can place a finger over the tube in the middle of the chamber to prevent powder from blocking the air line. Next, the handpiece and mouthpiece are connected on the control on top of the powder chamber to make sure that the head is seated according to the patient’s needs. For treating patients with heavy stains, it is recommended that the air-polisher should be turned to “5” for heavy powder flow, which is approximately the 12 o’clock position. For patients with light staining, the control knob would be set to “9” for reduced powder flow, which is approximately the 6 o’clock position (Fig. 4).

An aerosol-reduction device that connects to the saliva ejector or high-speed evacuation system used with the air-polishing handpiece has been shown to be effective in controlling and reducing airpolishing aerosols, thus decreasing the potential for disease transmission. The aerosol-reduction device works by attaching the aerosol-reduction device to the visible aerosol normally produced during air-powder polishing. Additionally, the aerosol-reduction device (Fig. 5) eliminates the need for exact vapor control with respect to the evi- dence, hand-capping and patient po- sitioning.

Another advantage to the aerosol-reduction device is the possibility of tooth abrasion because the cube is placed longer than in traditional polishing techniques. When using the aerosol-reduction device, the clinician has shown that the aerosol-reduction device contains two...
all tooth surfaces are adequately to interproximal. In addition, a sys is directed toward the middle third of vestibule minimizes aerosol and eases because that reduces the abrasive (approximately 3 to 4 mm). Hold appropriate distant from the tooth surface for each segment of tooth.

The recommended technique prevents undue aerosols from de flacting back to the clinician or being directed into the patient soft tissues. Most importantly the clinician should be aware to di

Clinical technique

There is a universal air-powder pol

The clinician should establish and maintain a systemic pattern when using the air-powder polisher. The nozzle tip should maintain an appro

The clinician should use a constant circular motion, sweeping or paint

Fig 5. Aerolase-reduction device. (Photo Provided by Dent/TYPE Retiree Exiss)

Fig 4. Setting systems for High intensity, Sequential, Manual and long cycle. Aerolase

The “manual” cycle setting enables the clinician to use the Tap On foot technology control to alternate man

The DENTSPLY Cavitron Jet Plus® has “Tap On” technology (Fig. 5) that automatically cycles between rinse and polish, thus eliminating the need for the clinician to pump the pedal. Tapping the top foot pedal activates the Tap On automatic polishing/rinse cycle, which lasts for approximately one second. Tapping the pedal a second time deactivates the automatic air-polishing/rinse cycle.

The autocycles work in short, medium or long settings (Fig. 7) within the patient’s mouth, it is recom

The clinician then needs to remove any residual powder from the cham ber with a HVE and activate the unit.

The clinician should be aware to di

When air-polishing the anterior tooth, the tip should be directed at a 60-degree angle to the tooth, for pos

Conclusion

Therapeutic polishing is the removal of stains from the unexposed root surfaces, which results in a decrease in disease parameters. Polishing root surfaces is possible with both the rubber-cup and airpowder polisher, however, the rationale for selecting the air-powder polisher is for its ef

The answers and critiques published herein have been checked carefully and represent authors’ opinions about the questions concerned. Articles are available in www.cappmea.com after the publication. For more information please contact evans@cappmea.com or +971 4 3484474

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DENTSPLY Cavitron Jet Plus® is a Polisher with a HVE and activates the unit. He can be contacted by email at edincer@hostos.cuny.edu.

References are available from the author.