Pilates exercises for a dentist with Forward Head Posture and Round Shoulder Posture

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Abstract

Muscular and skeletal structures can develop into an unhealthy shape due to a reduction in physical activity and inappropriate posture habits in daily living. Any activity that causes the body to look down and forward for long periods of time can contribute to Forward Head Posture and Rounded Shoulder Posture.

In general, the dental profession serves as an excellent example where enormous strain is put on the body often causing posture and alignment issues. Dentists may sit or stand for many hours at a time in a hunched over or forward leaning position leading to forward neck posture, rounded shoulders and slouched posture. In addition, the unusual movements and interactions between the head, neck, and shoulders due to rounded shoulders may lead to additional health issues.

This paper will suggest the optimal exercises from the BASI block system to improve the posture of a dentist with a forward head posture and rounded shoulders.
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Anatomy of the Cervical Spine

The cervical spine is made up of seven vertebrae located in the neck connecting the base of the skull and the thoracic spine. It supports a head weight of roughly 4.5kg. The vertebrae of the cervical spine get bigger as you move down from the top of the spine towards the lower vertebrae and provides extra support to the head. The cervical vertebrae are the smallest of the vertebrae in the spine but are also the most mobile, starting with the first two vertebrae, C1 and C2. C1, also known as the atlas, is the ring-shaped vertebra that connects directly to the skull and its joint allows the head to nod in a “yes” motion. C2, or the axis, has a peg-shaped structure called the odontoid that allows the skull and atlas to pivot around. This joint allows the head to move from side to side in a “no” motion of the head. C3-C6 vertebrae are typical vertebrae in the sense that they share common traits with other vertebrae of the spine.

Figure 1.
Anatomy of the Shoulder

The shoulder is made up of the scapula, clavicle and the humerus. The only bony attachment of the upper extremities to the axial skeleton is via the clavicle at the sternoclavicular joint. The Glenohumeral joint is a ball and socket joint that allows the arm to rotate in a circular way or to hinge out and up away from the body.(Fig.2)

The humerus is kept in the glenohumeral capsule by the rotator cuff under the acromion. The bursa between the rotator cuff and the acromion allows the rotator cuff tendons to glide freely, thus moving the arm. The rotator cuff is a group of four muscles (supraspinatus, subscapularis, infraspinatus, and teres minor) that surround the shoulder joint and connects the scapulae to the humerus.(Fig.3)

The scapula articulates with the humerus at the glenohumeral joint and with the clavicle at the acromioclavicular joint.

Figure 2. Figure 3.
Anatomical Description of Forward Head Posture and Round Shoulder Posture

Among a number of major muscles in the neck, the sternocleidomastoid bridges the head and ribcage, and is vital to the flexion and rotation of the head. The trapezius is connected to the base of the head, on either shoulder and much of the thoracic spine and mainly stabilizes and moves the scapula, but also allows flexion and rotation of the head.(Fig.4)

When the head moves forward, it pulls the shoulder blades forward which then makes contact with the upper ribcage and in this manner the ribcage is pulled forward. As a result, the upper trapezius, anterior deltoids, subscapularus, latissimus dorsi, pectoralis major and minor, and the sternocleidomastoid muscles are shortened. Releasing these muscles by using stretching exercises can help expand the chest and brings the head and shoulders back to optimal alignment.

On the other hand, the mid/low trapezius, rhomboids, posterior deltoids, rotator cuff muscles, deep cervical extensors and deep cervical flexors that become long and weak must be strengthened in order to pull the head and shoulder back in to ideal alignment.(Fig.5)
Case Study

Name: Hyunjung Kim  Age: 29 years old  Gender: Female  Occupation: Dentist

Hyunjung Kim owns her own small clinic in Woodstock, and she drives to work from Somerset West every day of the week, as well as on Saturdays. In her dental practice, her work requires sitting down for a long periods of time when seeing patients. After work, she spends time on her computer. As I have observed her regular life pattern, she spends most of her time in a sedentary position in the car, in the office, and at home. It is not surprising that she has had lower back issues and stiffness with pain across her upper back, shoulders and neck. She also complains about tight hamstrings, balance problems, and a general lack of mobility in her body. Her only physical activity outside is to take her dog for walk once or twice a week for half an hour. Once I introduced her to one of my mat group Pilates sessions, she showed interest and she had been attending for about six months but couldn’t continue due to work commitments. When I convinced her again to be my case study, she decided to commit to one-to-one Pilates sessions and agreed to come once a week.

When I analyzed her posture, I noticed her head and neck are forward of the plumb line. She also has increased curvature of the thoracic spine and lumbar spine. Her pelvis is forward to the plumb line and also has more of an anterior tilt. She also has tight anterior shoulder muscles and long posterior shoulder and upper back muscles. In addition, she has very tight hamstrings and very little range of motion in her hips. It is difficult to lift her arms above her head due to small range of arm flexion and extension. Her weak balance and body awareness also caused falling injuries in the past.

I am aiming to strengthen her body and improve her posture in general, but with special emphasis on her forward head and rounded shoulders with the aid of the BASI Block system. At the same time, I also explain to her that Pilates is a full-body holistic discipline which
involves not only movement but also body awareness and mindfulness so that it will help to cope with her stressful life.

### Conditioning Program

<table>
<thead>
<tr>
<th>Block/Apparatus</th>
<th>Exercise</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td><strong>Warm Up Mat</strong></td>
<td>Roll Down&lt;br&gt;Pelvic Curl&lt;br&gt;Spine Twist Supine&lt;br&gt;Chest Lift&lt;br&gt;Chest Lift with Rotation</td>
<td>Starting to gently move the body, and get blood going. Good for assessing mobility, flexibility and strength.</td>
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<tr>
<td><strong>Foot Work Wunda Chair</strong></td>
<td>Parallel Heels&lt;br&gt;Parallel Toes&lt;br&gt;V Position Toes&lt;br&gt;Open V Heels&lt;br&gt;Open V Toes&lt;br&gt;Calf Raises&lt;br&gt;Single Leg Heel&lt;br&gt;Single Leg Toes</td>
<td>Focusing on trunk and pelvic stabilization, while strengthening quadriceps and activating hamstrings.</td>
</tr>
<tr>
<td><strong>Abdominal Work Wunda Chair / Step Barrel</strong></td>
<td>Standing Pike Reverse&lt;br&gt;Chest Lift&lt;br&gt;Overhead Stretch</td>
<td>Working on abdominal control, back extensor control on the chair. With the barrel, focusing on thoracic stretch and shoulder mobility while working the abdominals.</td>
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<tr>
<td><strong>Hip Work Reformer</strong></td>
<td>Supine Leg Series:&lt;br&gt;Frog&lt;br&gt;Circles Down / Up Openings</td>
<td>Stabilizing in pelvis and focusing on hip disassociation to allow hip joint to mobilize while working on hip adductor and extensor strength.</td>
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<tr>
<td><strong>Spinal Articulation Reformer</strong></td>
<td>Short Spine</td>
<td>Working on spinal articulation, hamstring and lower back stretch and hamstring strength as well.</td>
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<tr>
<td><strong>Stretches Step Barrel / Pole</strong></td>
<td>Shoulder Stretch Lying Side&lt;br&gt;Pole Series:&lt;br&gt;Shoulder Stretch&lt;br&gt;Overhead Stretch&lt;br&gt;Side Stretch&lt;br&gt;Spine Twist</td>
<td>Increasing ROM in shoulder, opening chest, stretching pectoral and hip flexor. Progression gradually in the thoracic extension and opening up the back. Emphasis on anterior shoulder and chest stretch, lower trapezius strengthening, oblique control and stretch.</td>
</tr>
<tr>
<td>Full Body Integration Cadillac</td>
<td>Sitting Forward Side Reach Kneeling Cat Stretch</td>
<td>Understanding abdominal engagement and spinal articulation in full body movement. Opening chest while stretching side and shoulder in side reach. Challenging on hamstring stretch as pressing feet against the pole. Start with bent knees to get back upright position.</td>
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<tr>
<td>Arm Work Ped-o-Pull</td>
<td>Extension Adduction Circles Up/Down Triceps</td>
<td>Strengthening of shoulder extensors and stretching an anterior shoulder, increasing shoulder range of motion in the shoulder, while keeping trunk and scapula stable.</td>
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<tr>
<td>Leg Work Wunda Chair</td>
<td>Leg Press Standing</td>
<td>Emphasis on balance, posture and strengthening and controlling the Gluteal muscles.</td>
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<tr>
<td>Lateral Flexion / Rotation Ladder Barrel</td>
<td>Side Over Prep</td>
<td>Lateral flexor stretch of the trunk while encouraging length through the spine, and abdominal oblique strength.</td>
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<tr>
<td>Back Extension Ladder Barrel</td>
<td>Basic Back Extension</td>
<td>Increasing back extensor strength, abdominal control and scapulae stabilization.</td>
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</table>
Conclusion

From the beginning, Hyunjung was fascinated by Pilates since it not only focuses on the physical aspects of exercise, but also on body awareness and mindfulness. She showed good focus and tried to execute every movement correctly and this improved her general posture and overall stability, flexibility, and strength in her entire body. Regular sessions also encouraged her to become more aware of her posture and tried to use that awareness throughout her daily activities at work.

These days she reports that she feels less strain in her neck and shoulders, her legs feel stronger when she works in a standing position, and the new strength of her abdominals and back muscles decreased the discomfort when sitting down at work. In addition, making use of deep breathing has helped her handle stress better in the work environment.

She realized Pilates is not an exercise limited to the gym only, but that Pilates techniques may be applied in everyday life and situations.

Pilates is indeed a comprehensive whole body exercise philosophy that not only improves conditions of physical discomfort, but also has a beneficial effect on our daily habits through its holistic approach to wellness.
Bibliography