"Limited companies – Should I practise as one?"

Continued from previous page

- As directors of the limited company you are liable to file the annual accounts and tax return at the Companies House, in addition to the maintenance of minutes on board meetings etc.
- As in the case of personal income tax returns, there'll be automatic fines for late filing of returns with the Inland Revenue and Companies House.
- There are likely to be taxable "benefits in kind" giving rise to tax liabilities on the directors e.g. company cars, and fuel etc of which proper records should be kept.
- There'll be an element of bureaucracy involved in the form of systems and controls since a company is a separate legal entity and its former owners now become employees as well as shareholders.
- It may not be easy to end a company since it has a separate legal entity, however owners (shareholders) can always relinquish their shares for a consideration as an exit strategy from the business.
- Set up costs and an increase in annual accountancy fees due to greater administration requirements.

Of course most of the disadvantages can be attributed to the tightly regulated procedures inherent in operating a limited company, which in turn will encourage greater financial controls and systems leading to better practice management techniques and therefore more profit!

So what should you do?

In this article we intended to draw your attention to the preliminary aspects of incorporation and its main advantages and disadvantages. Incorporation may not be for everyone. It is important to weigh the advantages and disadvantages of incorporation in light of the particular circumstances of your practice, its growth objectives, and your exit strategies and retirement options etc.

However, if the Chancellor does not change the current small company tax rules, in our opinion, for many practices, the advantages will outweigh the disadvantages of turning your practice into a limited company.

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Silver Alloys: Do we need the variety?

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Silver amalgam went through no major changes until 1962 when Youdelis developed an alloy containing high than normal copper content by adding an admixed copper-eutectic sphere. This allowed formulation of the gamma 1 phase and a new phase composed of copper and tin that eliminates the weaker and more corrosive prone gamma 2 phase.

Today's alloys are composed of silver (40-70%), tin (12-30%), copper (12-30%), indium (0-4%), palladium (0.5%), and zinc (0-1%). The zinc reportedly aids the amalgam by reducing corrosion.

Despite adverse publicity regarding the mercury toxicity (see below), amalgam still remains the material of choice in many situations. It is by far the most cost-effective material and not technique sensitive. In clinical practice, there appears to be less secondary caries around silver amalgams. The design of the cavity has changed considerably. A long term study conducted by Osborne and Gale concluded that the most important factor in the length of the service of an amalgam filling was the preparation width. These studies strongly support conservative preparation and the resulting smaller preparation. A combination of fissure sealants and amalgam offers many advantages.

Within the currently available alloys, there is a choice of spherical and lathe-cut and admixed varieties. The spherical alloy (especially with higher silver content) with an increased surface area, is more reactive with mercury, requires less mercury for trituration and is generally quicker setting. It is also smoother on finish and requires less condensation pressure to pack in the cavity. Furthermore there are high copper non-gamma 2 alloys which reduce the tin-mercury phase, and are more corrosion resistant.

The lathe-cut alloys are generally rougher, more difficult to triturate and other than being cheap offer little advantage.

"…it is obvious that a discerning practitioner should possess more than one type of alloy and vary the use according to individual needs."

Applications

1. Large Class V cavities (Fig 1-4) and around pins:

The above properties of each alloy could be used to our advantage depending on the requirements. For example, where it is difficult or impossible to use a matrix such as a disto-buccal cavity in a tooth, reduced condensation pressures are useful as the amalgam can simply be "tapped" in place. When one tries to use a lathe-cut alloy in these situations, it gets very frustrating as during condensation the amalgam simply runs out of the cavity!

This property is also useful for condensing around pins. It seems reasonable to expect that spherical alloys may also be easier to condense into retention slots. The latter are now preferred instead of threaded pins in order to reduce stresses in the dentine.

2. Core Build Up:

There are many materials designed for a core build up which can be immediately prepared for crowns. All are based on either Glass Ionomers or Composites or a combination of the two. The Glass Ionomers are inherently weak, albeit adhesive and composites absorb water. Whilst all these materials can be used successfully as space fillers (where there is sufficient tooth structure left to support a crown), the challenge is greater when one needs a material to actually support the supra-structure. In extreme cases, a cast core may be the only answer.

The advantage of using amalgam is firstly

Figure 1: Caries due to food packing and poor plaque control

Figure 2: on completion

Figure 3: Radiograph of above patient

Figure 4:

its ease of use and probably more importantly the similarity in texture to dentine when cutting. It is said it "feels like man made dentine". As with any other material the margins should be sited on natural tooth and ideally 2 mm of the vertical height of the tooth should be available throughout the circumference of the tooth.

A spherical alloy (such as Kerr Tytin), due to its quick set may be used for core fabrication which can be prepared within about ten minutes or so.

Spherical alloys reach superior 1 hour compressive and tensile strengths compared to lathe-cut alloys. They may be therefore preferred in young persons where advice to refrain from eating may not be followed.

3. For simple Class 1 and 2s

The alloy generally favoured in this situation is high copper non- gamma 2. This is easy to use and is very corrosion resistant and does not need to be polished.

All amalgam restorations initially leak at the interface. Corrosion products eventually fill this space. In high copper alloys this may not happen for a long time. Copal resin significantly reduces microleakage although its solubility in oral fluids limits its effectiveness to about 6 months. Amalgam bonding agents are also useful in this regard.

4. Two adjacent Class 2s (e.g. DO on first molar and MO on second molar) where a tight contact may be difficult to achieve.

When these are restored together, it is often helpful to fill one of the cavities with a spherical quick setting alloy first. The matrix band is then removed and inserted on the adjacent tooth where an admixed alloy can be used to pack the cavity with enough condensation pressure to ensure that a good contact point is established with the newly filled cavity. If one tries to use spherical alloy in the latter situation, especially where the contact point is potentially difficult to form, an open contact may result. In extreme cases it may be necessary pre-contour a band using contouring pliers and resort to lathe-cut alloy which will take higher condensation forces and retain the band tight against the adjacent tooth.

5. Large Amalgams (Amalgam crowns)

There are situations for example when an endodontic status of the tooth is being monitored or for economical reasons, it may not be appropriate to do a definitive restoration on a tooth. In such cases, it is very prudent to do a large amalgam restoration preferably bonded to the underlying dentine. Whilst the data on long term stability of resin bonded restorations is uncertain, it seems to be good practice to use adhesives on such restorations. Panavia X, Allbond, Optibond and Amalgabond are amongst the many adhesives that can be used for this purpose.

6. Repair of amalgam defects:

Where there are ditched margins (no caries), current recommendations are not to replace the filling but merely seal the defects with a sealant.

7. Moisture contamination:

Where it is impossible to control moisture contamination through adequate isolation, it may be prudent to use non-zinc alloys. The latter tarnish more easily, but the zinc containing alloys if contaminated with moisture may cause delayed expansion and post-operative pain.

Amalgam toxicity facts:

- 30 μg could be released during a clinical session (using water cooling and aspiration)
- Urinary mercury levels for dentists 2.18 mmoles mercury/mole creatinine
- Urinary mercury levels for nurses 2.26 mmoles mercury/mole creatinine

What it means:

- 0-5 – Band A – Normal for occupation
- 5-10 – Band B – Some exposure
- 10-20 - Band C – Significant exposure
- >20 - Band D – Exceeds HSE Health Guidance Value

Mercury Toxicity:

Forms

- Metal (Hg0) (absorption ~ 0.01%)
- Inorganic ion (Hg^{2+}) (absorption ~ 1 -7%)
- Organic (methyl or ethyl mercury) (absorption ~90%)

Access to body

- Skin
- Vapour
- Gut

Mercury in Silver Amalgam

- About 1-3 μg/day as amalgam particulate Hg0
- In parafunctionists, ingestion ~45 μg/day as amalgam particulate or Hg^{2+}
- But gut absorption is about 1 – 7 %
- Half life is about 20 – 90 days
- Fish consumption is about 4 μg/day of methyl mercury (absorption >90%)
- Intake from all sources other than amalgam ~20 μg/day of Hg^{2+}

From the foregoing, it is obvious that a discerning practitioner should possess more than one type of alloy and vary the use according to individual needs.

Newer developments have focused the need to reduce residual mercury in amalgam in order to reduce the alleged (potential) toxicity are described in Part 2

In Next Issue

Part 2 - Newer developments with emphasis of reducing mercury toxicity.