

On Lambs, DBS And Diathermy

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Purpose

There is a paucity of evidence regarding the safe use of surgical electrocautery in patients with Deep Brain Stimulation (DBS). We critically examine the evidence for the current guidelines and explore the effects of surgical electrocautery on a DBS system.

Materials and Methods

In the first part of the study, a literature search was performed using relevant key words and the evidence base was correlated with current safety guidelines.

For the second part, a DBS system was implanted in tandem with a thermocouple into a fresh lamb carcass. Monopolar electrocautery was then employed at fixed settings and distances from the neurostimulator. Brain temperature was recorded throughout. The brain was harvested post procedure for histopathological analysis.

Results

Despite a wealth of literature from over 30 years of experience, the current safety guidelines are based on only 2 case reports with no Class I or Class II evidence.

We show that the application of monopolar electrocautery in the presence of a DBS system led to temperature changes in the brain site which increased with the power setting and proximity to the neurostimulator. However, even at supramaximal settings, the temperature rise was never more than 2.7 degrees and the highest temperature was 29C which is well below the threshold for tissue damage. Additionally, there was no evidence of thermal injury in the brain around the electrode.

Conclusion

Surgical electrocautery in the presence of DBS is safer than previously assumed and more work is called for.