



Drains for thyroidectomy/parathyroidectomy: fact or fiction?

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Background: Many authorities advocate draining the neck routinely after thyroid and parathyroid surgery with no scientific evidence to support this practice. We aimed to establish if the routine use of drains following thyroid/parathyroid surgery is of any value.

Method: Medical records of patients who underwent thyroidectomy or parathyroidectomy under the care of a single endocrine surgeon (GP) over a 14-year period were reviewed. For the first 6 years, the neck was routinely drained (drain group) and for the subsequent 8 years the neck was only drained if the surgeon felt it necessary according to the operative situation (selective group).

Results: A total of 606 procedures (425 thyroidectomy and 181 parathyroidectomy) were performed on 582 patients. Drains were routinely used in 134 (22%) procedures (drain group) and were selectively used in 472 (78%) (selective group) of which 191 (40%) were drained. In all patients, there was a significant increase in the rate of postoperative bleeding/haematoma in patients with a drain (8/314 versus 1/282, Fisher's exact, $P < 0.05$). Wound infection occurred only in the patients with a drain. There was no difference in the incidence of postoperative bleeding and airways obstruction between the drain and selective groups.

Conclusion: We conclude that the routine use of neck drains is unnecessary and may indeed be harmful, drain insertion being associated with an increased incidence of wound infection. Drains should, therefore, be used selectively after thyroidectomy and parathyroidectomy.

Key words: Thyroidectomy – Parathyroidectomy – Drainage – Postoperative complications

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Many authorities advocate draining the neck routinely after thyroid and parathyroid surgery^{1,2} and, although several studies have failed to show any benefit from neck drainage,³⁻⁵ many surgeons still use neck drains routinely. The main reason proposed for drainage is to avoid wound haematoma and seroma and, therefore, prevent the resulting airway compression and obstruction. We aimed to establish, in a large cohort of patients, if there were any benefits of routine neck drainage and asked the critical questions; (i) do drains avoid postoperative haematoma and the resulting airways embarrassment? and (ii) does routine drainage have any adverse effects?

Patients and Methods

Medical records of all patients who underwent thyroidectomy or parathyroidectomy between 1982 and 1996, under the care of one endocrine surgeon (GP) at the Royal Victoria Infirmary, Newcastle upon Tyne, UK, were reviewed.

For the first 6 years the neck was always drained (drain group) and in the following 8 years the neck was only drained if the surgeon felt it was necessary (selective group). In the selective group, drains were only used if the surgeon felt that there was a large dead space or if the operative field was not completely dry at the end of the procedure. Closed system suction drains were used when the neck was drained in both groups. Data relating to postoperative bleeding, airways embarrassment, wound infection and length of hospital stay was collected using a standard form. Data from the drain and selective groups were analysed and then data from patients with and without drains regardless of group were compared. Statistical analysis was performed, using Epi info (WHO, Geneva, Switzerland) Chi-square test with Yates' correction or Fisher's exact test was used for comparison of categorical data and Mann Whitney U-test was used for nonparametric data.

Results

A total of 606 procedures (425 thyroidectomy and 181 parathyroidectomy) were performed on 582 patients (89 males and 493 females); of these, 274 (64.5%) of thyroidectomy and 48 (26.5%) parathyroidectomy patients had neck drains inserted. Drains were routinely used in 134 (22%) procedures (drain group) and were selectively used in 472 (78%) (selective group) of which 191 (40%) were drained. Figure 1

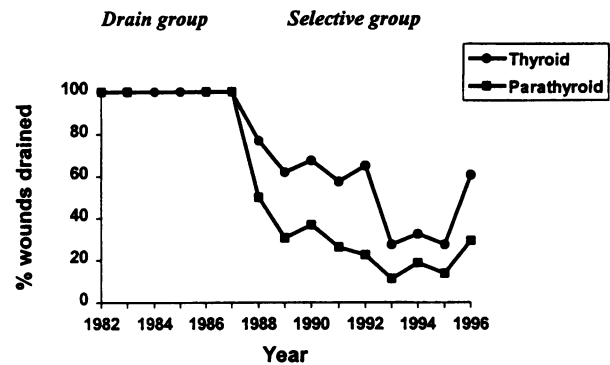


Figure 1 Use of drains in thyroid and parathyroid operations over the 14-year period

shows how the practice of neck drainage altered over the period of 14 years. The drain group consisted of 112 females and 16 males with a mean age of 42 years (range 18–79 years) and the selective group contained 381 females and 73 males with a mean age of 49 years (13–92 years). More parathyroidectomies and total thyroidectomies were performed in the selective group than in the drain group. Other than this, there was no significant difference in the diagnosis or the procedure performed in the two groups.

Bleeding

Postoperative bleeding was divided into minor and major bleeding. Minor bleeding was defined as the development of small, superficial wound haematomas, or bruising, which required no intervention. Major bleeding was any bleeding which required intervention. A total of 9 patients developed postoperative bleeding, 2 (1.5%) in the drain group and 7 (1.5%) in the selective group. There were 2 minor bleeds recorded in each group. Major bleeding occurred in 5 patients, all of whom were in the selective group. The patients with major bleeding, all had increasing swelling of the neck in the first few hours after surgery reported by vigilant nursing staff, 3 in the recovery room and 2 on the ward. Of these, 4 (80%) had drains already in place which had become blocked with clot and were none functional. The fifth patient developed major neck bleeding 24 h after parathyroid surgery while he was on intravenous heparin infusion as anticoagulant cover for an artificial heart valve. All these patients required surgical evacuation of the haematoma and arrest of bleeding in theatre. There was no increase in the risk of bleeding with second operative procedures or in operating on

Table 1 Details of 9 patients with postoperative bleeding

Age	Sex	Group	Drain	Type	Airway obstruction	Treatment	Operation	Diagnosis
35	M	Drain	Yes	Minor	No	None	Subtotal thyroidectomy	Toxic goitre
30	F	Drain	Yes	Minor	No	Spontaneous discharge	Lobectomy	Adenoma
31	F	Selective	No	Minor	No	Aspiration	Subtotal thyroidectomy	Toxic goitre
54	M	Selective	Yes	Major	Yes	Operative	Total thyroidectomy	Hashimoto's thyroiditis
59	M	Selective	Yes	Major	No	Operative	Subtotal thyroidectomy	Nodular goitre
47	F	Selective	Yes	Minor	No	None	Subtotal thyroidectomy	Toxic goitre
76	F	Selective	Yes	Major	Yes	Operative	Lobectomy	Nodular goitre
78	F	Selective	Yes	Major	No	Operative	Lobectomy	Nodular goitre
62	M	Selective	Yes	Major	Yes	Operative	Parathyroidectomy	Hyperplasia

Table 2 Details of 6 patients with postoperative wound infection

Age	Sex	Group	Drain	Type	Operation	Diagnosis	Treatment
47	M	Selective	Yes	Cellulitis	Parathyroidectomy	Hyperplasia	Antibiotics
43	M	Selective	Yes	Abscess	Subtotal Thyroidectomy	Nodular	Drained
42	F	Selective	Yes	Cellulitis	Subtotal thyroidectomy	Toxic	Antibiotics
53	F	Selective	Yes	Abscess	Subtotal thyroidectomy	Nodular	Drained
39	F	Drain	Yes	Abscess	Lobectomy	Adenoma	Aspirated
40	F	Drain	Yes	Cellulitis	Subtotal thyroidectomy	Toxic	Antibiotics

retrosternal or toxic glands. There was a significant increase in the incidence of postoperative bleeding in all patients who had drains (8/314 versus 1/283, Fisher's exact test, $P < 0.05$). This finding was not surprising since, in the selective group, only patients who were thought to be at a risk of postoperative haematoma received drains. None of the patients with haematoma developed a subsequent wound infection. Table 1 shows details of 9 patients with postoperative haematoma.

Airways embarrassment

Airways embarrassment caused by major bleeding occurred in 3 (0.5%) patients. All of these patients had wound drains *in situ* and drainage did not prevent this complication.

Infection

Wound infection occurred in 6/606 (1%) of all procedures, 2/134 (1.5%) in the drain group (one cellulitis and one superficial abscess) and 4/472 (0.8%) in the selective group (two cellulitis and two superficial abscesses). All patients with wound infection had neck drains inserted (Fisher's exact test. $P < 0.05$). There was no increase in the risk of infection with second operative procedures or in operating on retrosternal or toxic glands. Table 2 shows details of 6 patients with wound infection.

Hospital stay

Patients in the drain group had significantly longer hospital stay than the selective group with a median of 5 versus 4 days (Mann Whitney test, $P < 0.05$). In the selective group, patients with drains had significantly longer hospital stay than those without drains with a median of 4 days (Mann Whitney test, $P < 0.05$). However, in view of the fact that length of hospital stay is influenced by many other factors over the 14 years covered by this study, results for length of hospital stay were further analysed year by year. This failed to show any significant difference in hospital stay between those with drain and those without in the selective group and, furthermore, there was a steady trend to discharge patients early with the passage of years.

Discussion

Major complications in thyroid and parathyroid surgery are related to injury of the recurrent laryngeal nerve, hypoparathyroidism and problems related to wound complications.^{6,7} It has been a common practice to drain wounds routinely after thyroid and parathyroid surgery⁸ However, the frequency of serious postoperative haematoma is very low in neck surgery performed by experienced surgeons and does not seem to increase in the absence of drains.⁹ The low rate of postoperative haematoma/bleeding (1.5%) in this

study is well within the range in other published series.^{5,9-11} This retrospective review has failed to demonstrate that drainage in thyroid and parathyroid surgery is of any advantage to the patient. Other retrospective studies^{5,6} and randomised trials^{3,4,12,13} have also not shown any advantage in draining neck wounds following thyroidectomy or parathyroidectomy. We have shown that drains neither prevent postoperative haematoma nor facilitate its early diagnosis. The diagnosis of wound haematoma is made by observing the neck and noticing a progressive collection under the skin. Our experience, in common with others^{9,14} is that, in patients with major postoperative bleeding, the neck drains become blocked with blood clot and do not function.

Airway symptoms due to haematoma occurred in 0.5% of our patients, this again falls well within the range (0.1–1.1%) reported in another large series¹⁵ where, again, drainage of the neck did not prevent this complication. Most haematomata occurred within 4 h of operation; by definition, these patients developed a reactionary haemorrhage which, perhaps, resulted from the return of their blood pressure to its preoperative level during the postoperative period. In our view, a meticulous haemostatic technique is more important than the use of drains, Halsted¹⁶ highlighted this in 1913 in one of his publications on Grave's disease: 'haemostasis is attended to with scrupulous care and wounds are closed without drainage'.

This series shows that the routine drainage of wounds following thyroid and parathyroid surgery did not reduce the rate of haematoma/bleeding and the resulting airway compression. However, wound infection occurred in 1% of our patients and occurred only in those who had drains *in situ*; this is slightly higher than that reported by others.¹⁷ We suggest therefore, that as drain insertion is associated with wound infection and that the routine insertion of neck drains is of no additional benefit, neck drains should only be used selectively after thyroidectomy and parathyroidectomy.

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