a faculty teaches how to learn
and Life is an eternal faculty,
in which you must never graduate
and will eternally earn...

- dr. yalcin ergir (Life)

RIGHT HERE WAITING FOR YOU…

LIVE and ALIVE orthodontic eruption story of an impacted canine
(periodical case report)

Lecture for Dental Students –
by Dr. Yalcin Ergir - Orthodontist - Turkey

an impacted canine in maxilla,
only gives up resistance and erupts -
if it is a: "canine in love"

** ** **

FESTINA LENTE

If you are planning to erupt an impacted canine by means of orthodontic treatment;
besides having to be very kind to the tissues surgically -
you must "slowly" apply gentle orthodontic forces to the impacted canine &
you must "hurry" to take the short way home, with frequent clinical controls.

Not only canine; but every single tooth is valuable and of course:
“own” healthy tooth, with a healthy periodontium is always eternally much more precious than:
“stranger” endosseous implant supported restorations.

After puberty, if a maxillary canine tooth shows no sign of eruption, the area must be examined clinically and radiologically.

The position of the canine (the angular degree: whether it is horizontal, oblique or vertical),
the necessary space at the dental arch,
the bone structure & the health of the periodontal tissues,
will guide us in making in a plan in:

a- extraction or non-extraction of a first premolar tooth (/or a persistent deciduous canine /or both)
b- the surgical coordinates of soft tissues & bone
c- the orthodontic appliance systems and force vectors
d- the average period of the orthodontic journey and full treatment

ORTHODONTIC ERUPTION

The best treatment is prevention. The prevention begins with eliminating the potential factors if possible, before the natural eruption time.

This may be early extraction of a deciduous canine or maybe root cannot be resorbed by the permanent canine developing in an unnatural position and direction.

If this timing is missed and if the canine has not erupted long after puberty; it has to be tracked slowly to its original place in the dental arch like a White Submarine, which has to go “20000 Leagues Under the Sea”.

This treatment or this long journey may take between a year or two –
there may be multiple surgical operations at the beginning if the bonded bracket breaks deep inside the cavity.

Long term patient cooperation is essential as long term use of braces hygienically needs great discipline and social self-confidence as well.

BUT IT IS WORTH IT; when it safely and gloriously reaches to his corner at the harbor of the mouth.

It is your own tooth, it is vital; it can feel cold of ice-cream, the heat of coffee, the hardness of an apple with its micro neurovascular system.

If it is obvious that the impacted canine will not be able to make a healthy inter-bone journey or will harm other teeth- still another transportation and eruption method must be considered in treatment planning, before extraction and titanium implant applications: AUTOTRANSPLANTATION.

AUTOTRANSPLANTATION

Auto-transplantation of impacted (or embedded) canine tooth is the fastest way to carry the tooth to its original position on the dental arch – in proper dental alignment.

In autotransplantation, after the impacted canine tooth is reached by surgical means, it is kindly extracted in one piece – the root is filled by endodontic treatment and the extracted canine is implanted to the surgically prepared artificial cavity (or extracted deciduous tooth cavity) immediately.

Devital canine must be fixed to the neighbor teeth, till it reaches stability in its new alveoli. This fixation has to remain lifelong in “misforecasted”, “misplanned”, or “mistreated” applications.

This method is fast; BUT the tooth is no more vital afterwards. Beside the loss of proprioception, there are always risks of: *fusion, fragility, cystic or inflectional pathologies* in the future.

TITANIUM IMPLANTATION

Similar potential problems of a titanium implant supported restoration may bring esthetical dissatisfactions along as well.

“Healthy” & “Own” are 2 important keywords in our choice;
when an impacted canine in love with you is waiting to be erupted
and while you’re right there waiting for it.

DOING NOTHING AT ALL

Perhaps to decide whether “to begin” or “not to begin” a treatment is more important than deciding a method for treatment.

Every impaction is like a fingerprint: UNIQUE - in its circumstances.

So in some cases “doing nothing at all”, may be the best treatment method,
when local and systemic disease conditions are thoroughly observed.

If the canine is left impacted; there will always be a slight risk of leaving a pathogenic source for the future; but if it seems obvious that:
“Doing an orthodontic treatment” will give more harm than:
“Not doing an orthodontic treatment” –
“Doing nothing at all” will be the most healthy or least harmful choice, like:
“Making love out of nothing at all”.

WANTED; DEAD OR ALIVE?

“Healthy” suits “Alive”, much more than it suits “Dead”.

Listening to a song “Live” (even with mistakes) in a concert is much warmer than:
listening to a studio recorded, million times corrected industrial song.

For a dental student; learning a treatment method:
step by step “Live” & being explained “as” the treatment continues –
may be much more educational than reading an already completed case report.

SO HERE IS OUR FAITHFUL TOOTH FAIRY

SO HERE ARE STEP BY STEP EXPLAINED LIVE STAGES OF A SLOW - BUT VITAL (ALIVE) TREATMENT CHOICE, IN ERUPTING AN IMPACTED MAXILLARY CANINE TOOTH OF A 21 YEAR OLD ADOLESCENT:

2011-07-22

At the clinical examination of the patient's dental structure, an upper left persistent deciduous canine tooth is seen.

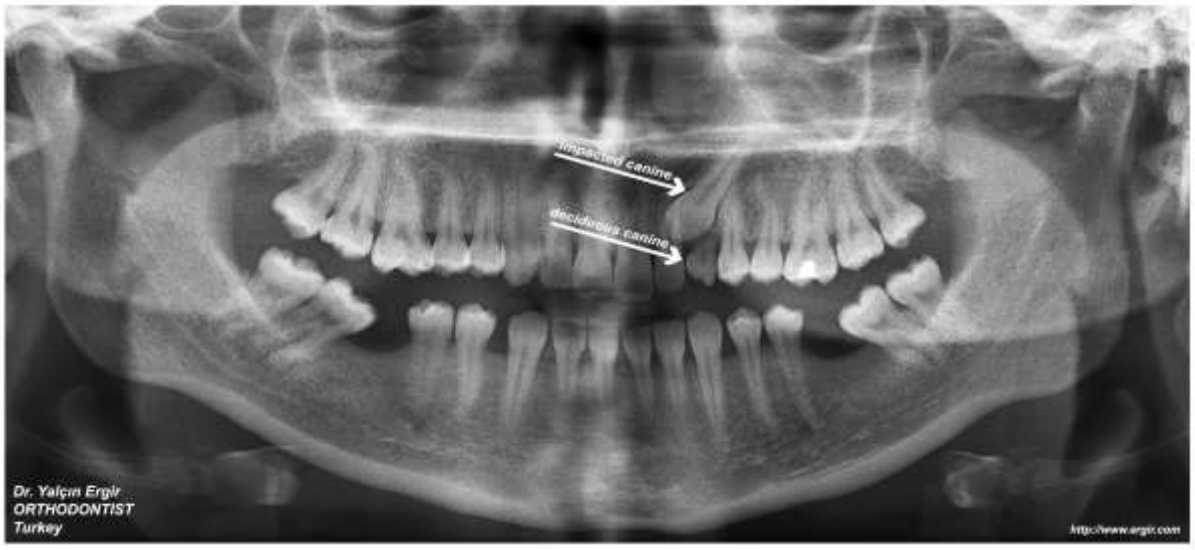
The anamnesis has no information about an erupted or extracted permanent canine tooth.

Panoramic radiograph shows the impacted permanent canine tooth in semi-oblique position, and the deciduous canine's half resorbed short & untrustworthy root. There is luxation at the deciduous canine in manual inspection as well.

There is no systemic disease and the periodontal status is perfect. The young bone structure of 21 year old patient will help us in choosing the Vital - **ORTHODONTIC ERUPTION** treatment method.

We can begin our long journey;
hope the impacted canine will feel the good wishes
and will give up its resistance, its eternal impaction with love.

After the location of the canine deep inside is determined,



in order to do the maximum bonding job before bleeding occurs by surgical reaching to impacted canine the maxillary teeth are cleaned and the brackets are bonded to the teeth (except deciduous canine, because it has to be extracted at the beginning of the surgical operation)

The necessary vestibule gingival region (the palate in most impacted canine cases) is anesthetized. The deciduous tooth is extracted. With surgical incision, the vestibule flap is lifted and a window is opened at the bone to reach the enamel of the impacted canine tooth.

After the suturing, the impacted canine is ready to be bonded and ready for orthodontic forces.

(surgery: Dr. Merih Baykara)

The surgically obtained soft tissue window tends to close within days while healing; so the bracket must be bonded as soon as the tooth can be reached.

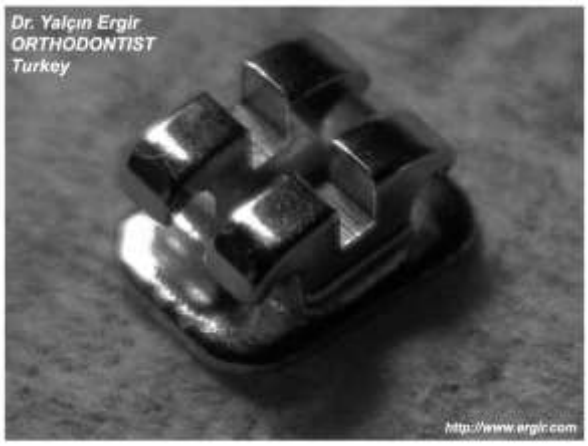
The necessary area for an orthodontist on the canine is not squares of meters:
just to expose 4X3 millimeters of enamel area for bonding a tiny bracket is enough.

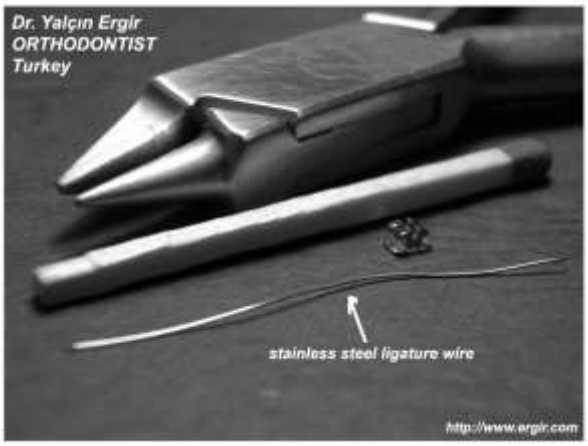
After the control of bleeding and the moment the surface can be kept dry – the bracket, preferably metal mandibular incisal bracket (not ceramic, for maximal endurance and minimal dimension factors) is bonded to the enamel of the canine.

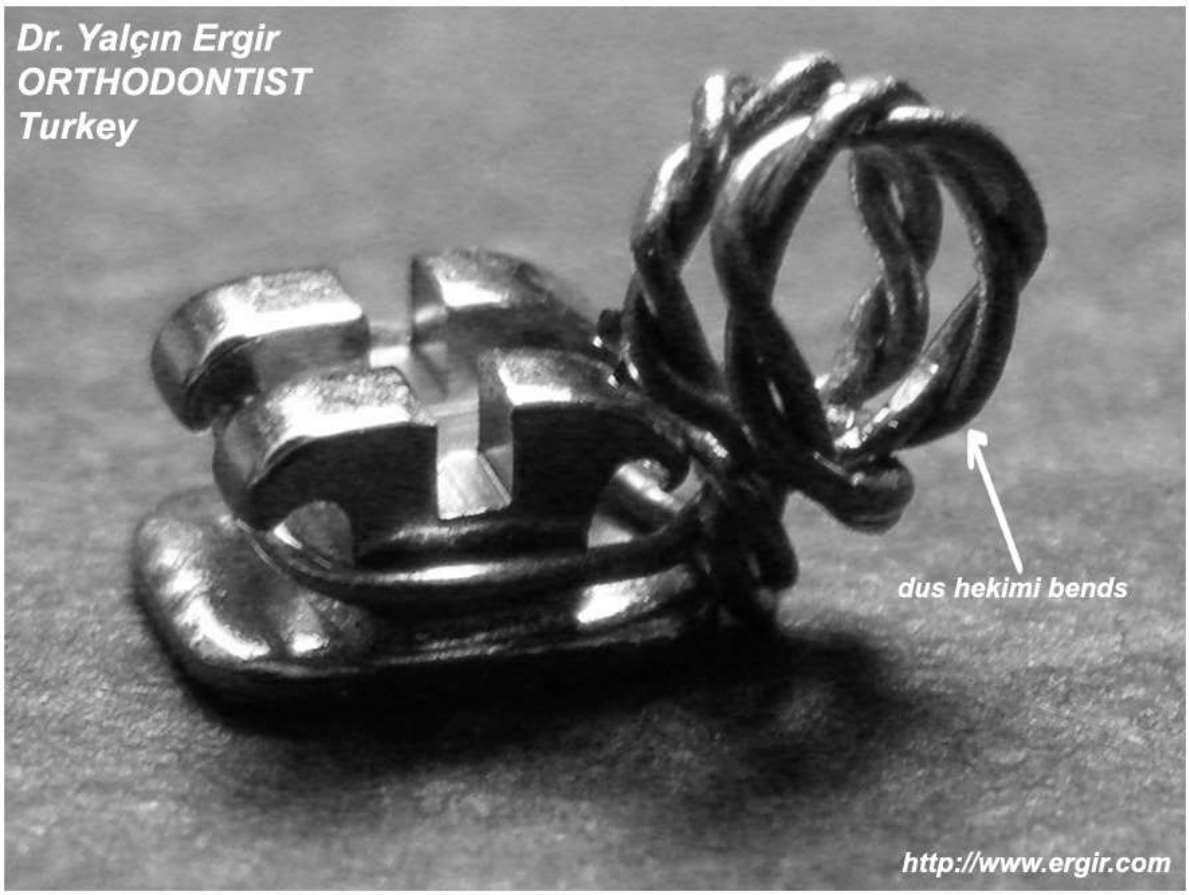
The bracket must be specially prepared before surgery
and suitable (+ reachable) anchorage points must be constituted.

Within years of experience, I think the best system is forming a “double loop” by a (Ø 0,25”) stainless steel ligature wire and tie it to the bracket before bonding.

A double loop with twisted wire will suspend the unwanted forces during eating and will decrease the breaking risk. This suspension will additionally act as an active wire and will be giving a continuous gentle pulling force to the impacted canine tooth.







During the bonding process, you must pay great attention to bleeding and moistening, as it will be very hard to re-bond the broken bracket at the beginning of the treatment, while the impacted canine is still lying deep inside - covered with fragile tissues.

The titanium wire cannot be applied to the maxillary teeth's brackets if the surgical interference should be applied from the vestibule region; so the wire must be put after the surgery and bonding is completed.

A loop to an appropriate region can be formed on the titanium wire, so that it can pull the impacted tooth's bracket in a proper vector by elastic threads or coil springs.

In this case, twin elastic threads are applied between the loops of the impacted canine and the (Ø 0,16") NI-TI wire.

2011-08-11

2 weeks later, the hypertrophic scar is excised and the new twin elastic threads are applied from the exposed bracket loops - to the titanium wire and its loop. We must apply even more gentle forces in these semi-blind & damp circumstances, in order not to re-bond a bracket if it breaks.

(surgery: Dr. Yalcin Ergir)

2011-08-24

it's coming; it's coming!...

A little smile can let all the sunshine in.

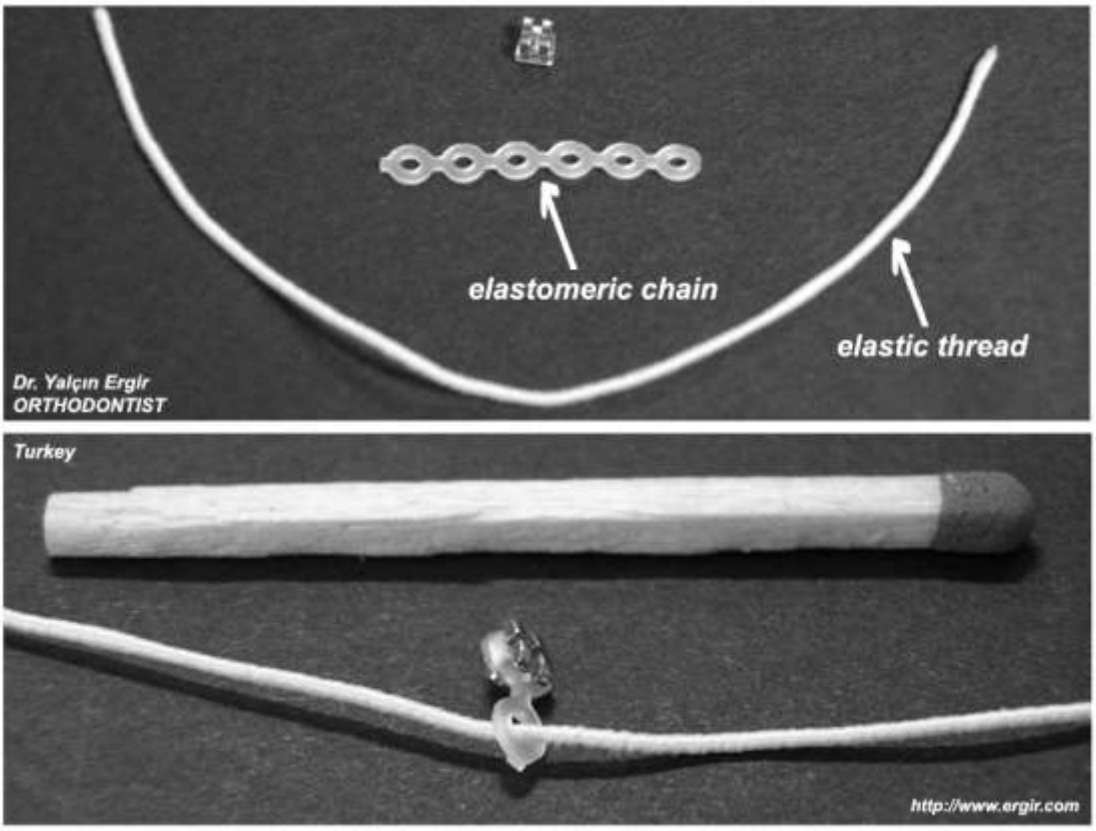
Now we must *festina lente* – hurry, slowly.

Canine is no more "that deep"; there is no more need for a loop with Dus Hekimi Bends. We can easily reach and apply our force directly to the bracket.

If we tie an “elastic thread” to the bracket, it cannot wrap the bracket properly at the bottom side - which needs a vertical and labial pulling force vector.

So we can use an “elastomeric chain” which will perfectly wrap the bracket and afterwards we can apply elastic thread’s pulling force to the elastic chain.

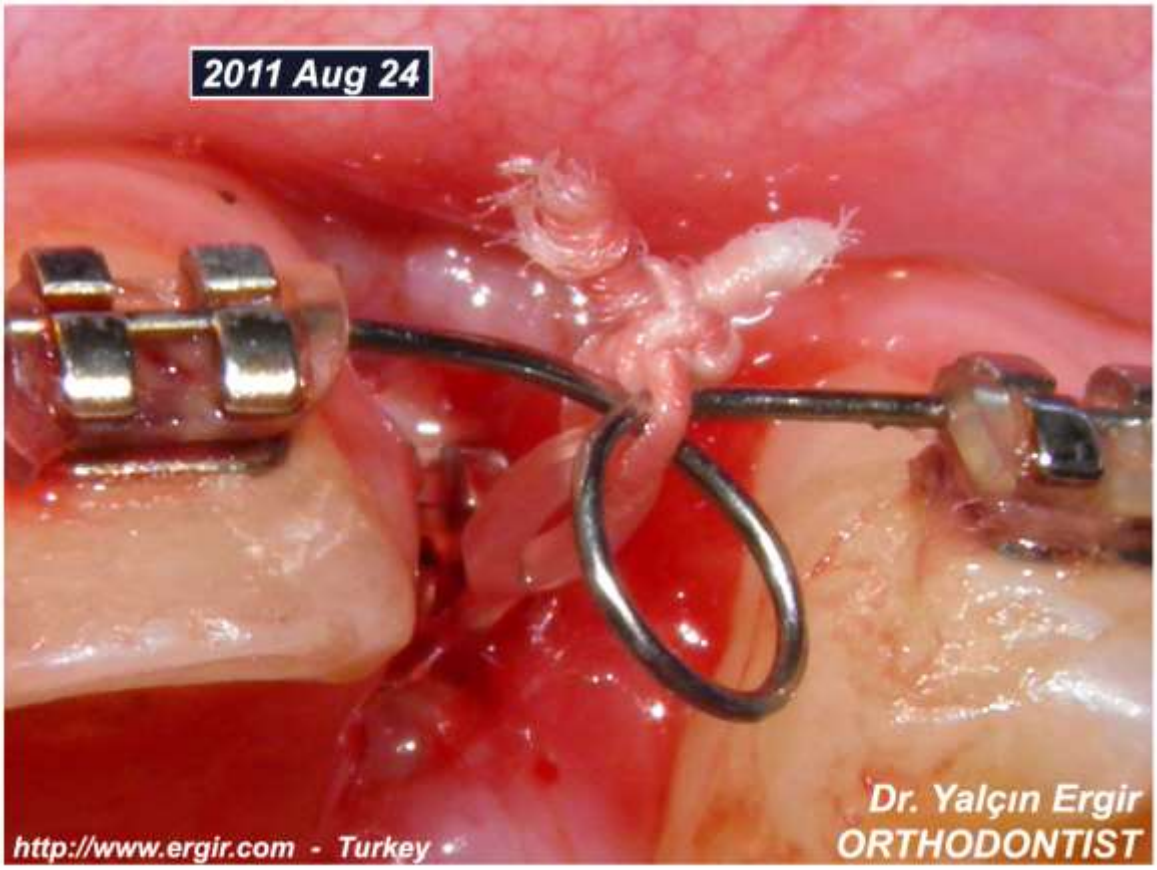
For that, we have to insert the thread to the chain, like inserting into a sewing needle.



Now we can sing: "**I've Got The Power!..."**

All we have to do is to stretch the thread (& chain) towards the Ni Ti wire.

And put a sailor’s knot for our submarine.



2011-09-30

biomechanic battle!...

This is a battle between bone tissue and orthodontic forces. As no healthy bone structure with a healthy periodontium can resist gentle and continuous orthodontic forces - WE WILL WIN!

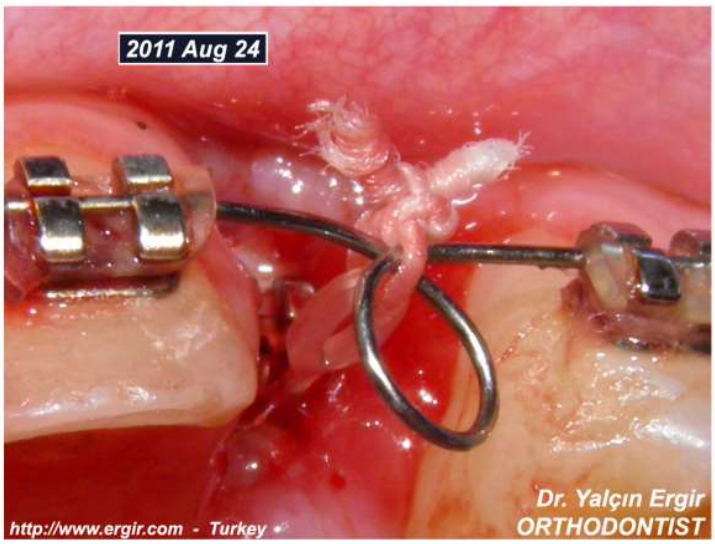
As the canine has erupted enough for the manually loop bended stainless steel wires to be applied, we can begin “Orthodontics’s Most Pleasant Application”= Bending Loops

Loops cannot be formed in Titanium Wires, so we have to use stainless steel wires for this oldie (but goldie) edgewise technique.

When you take a close look at this shiny bends, the deformation without irritating the gums can be seen and the continuous force applied to the bracket can even be felt in our heart.

When you make such a big deformation in applying the wire to its bracket slot, I use:
one elastomeric chain circle - for one ear of the twin bracket &
one (Ø 0,25”) stainless steel ligature wire - for the other ear,
to ensure stability.

And it can clearly be seen why we couldn't apply these loops before (2011 Aug 24)
as the bracket (our diamond) was still embedded in soft tissues:



wish you were here -
we will bring the diamond.
we are not only right here waiting -
we are right here fighting for you...

2011-10-26

3. month / what as a speed & new horizons

What as speed this month - thanks to "oldie but goodie" looped steel wires. Now it's time to change the position of the bracket.

Before we could only bond a small lower incisor bracket to the labio-distal part of the canine because the labial surface was hidden behind the palatinal surface of the lateral incisor tooth. With the new position, we can bond it more medially and gingivally, for more control, more force & less pandular movement.

And back to Titanium wire again. Today we have no pity; you can feel the great traction force on the canine when you look at the deformation of the wire. The the next 3-4 days will be a bit painful for our dear patient - but it is worth it as it is safely and gloriously coming - in "3 months", this view is incredible.

From now on:
it is no more an "Impacted Tooth" for us;
it is just (a bit severely) "Crowded Teeth".

And no crowded teeth can resist to Orthodontics -
we are winning - we are right here waiting for you...

2011-11-17

4. month / welcome party?

Can we get prepared for a "Welcome Party"?

Hurraaaay! From now on we can even "brush" the "no more-impacted" canine tooth -
even bite an apple at the 4th month of the treatment.

Now the central-labial part is no more under the bone and gingival tissues -

so we can debond the old bracket and rebond it to the ideal position at the central part of the labial surface.

With this new bonding, we take more control
and can guide the canine to its proper position and inclination in several months.

No elastic chain at this phase - the teeth must be roughly aligned regardless of space or crowding.

We will do the space "fine tuning" afterwards.

Impacted tooth?
What impacted tooth??

We have just "Death Cab for Cutie"s 2005 single: "Crooked Teeth" at the moment
and we are right here listening...

2011-12-14

4 MONTHS + 3 WEEKS

2011/
July 22-August 24-September 30-October 26-November 17-December 14

WE ARE PROUD AS TURKISH ORTHODONTISTS ☺

Andrea Bocelli and Sarah Brightman is singing: Time To Say Goodbye
and we are singing:

Time to apply rectangular NI-TI wire (Ø .018" x .025")

Because we need torque control for a tooth which has sailed a long distance,

in the "Bone Sea of Palatina".

Alignment of teeth is not a two dimensional operation. Teeth must be in harmonic relation with the peripheral bony structures three dimensionally.

While applying heavy torque forces to the root, my advise is to firmly attach the rectangular wire to the bracket slot by by tying a (Ø 0,25") stainless steel ligature wire.

Without harming the periodontal tissues and not devitalizing the tooth,
4 months + 3 weeks is a high-speed biological period in erupting a fully impacted canine tooth.

So; here is Hall's address,
if we want to take a "fast look" at the **Dance of the Tooth-Plum Fairy:**
http://www.ergir.com/2011/4_months_3_weeks.htm

2012-01-23

Now it is time for minor details in occlusion. We are all together at last; we can fly to the moon now - if only we don't hurry taking the brackets out. Fixed systems are always better than removable systems but hygenically we have take to begin using removable appliances - because fixed systems retain food particules as well *(which may a cause tooth decay or severe periodontal problems)* - as retaining a nice dental alignment.

The teeth have to fixed in their new positions and bone structure for several **"YEARS!"** inorder to prevent relapse problem.

****

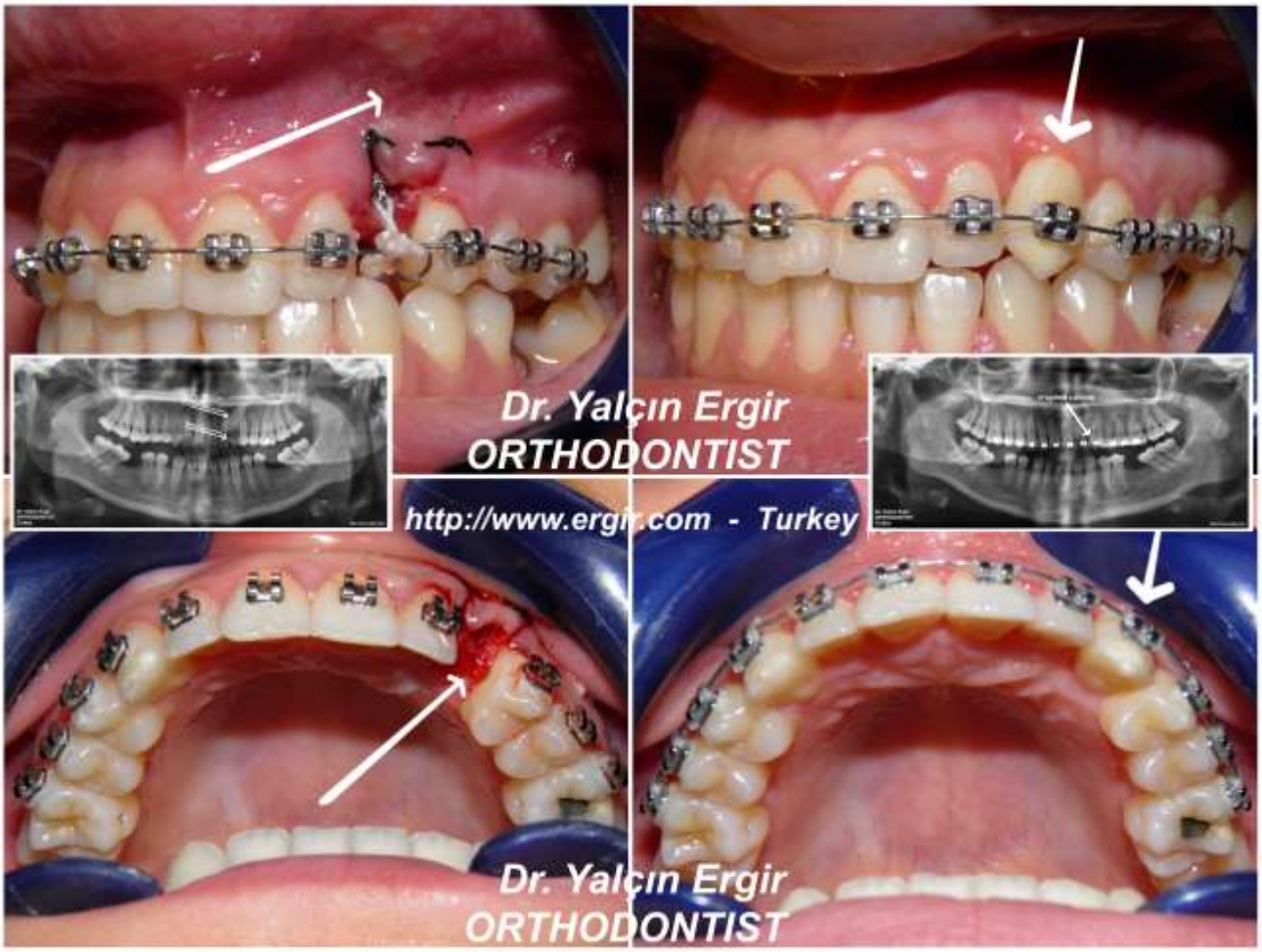
THIS IS VERY IMPORTANT;
NOT FOR MONTHS -
BUT FOR SEVERAL YEARS!

You may ask: "why must a "completely impacted canine tooth" be under retention for **YEARS,** if it can orthodontically erupt in only 6 months' time?

Relapse is a natural orthopedic response of the body which cannot be overcame in several months.

So we must wait patiently and after 2 months we must **CONTINUE** our treatment (retention) by invisible & removable appliances,

INORDER TO BE:



HAPPY TOGETHER - FOREVER....

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right here waiting…