```
ifthenelse_distr_subtype  THM

⊢  {x:A| if b→ P(x) else Q(x) fi }
|  =ext
|  if b→ {x:A| P(x) } else {x:A| Q(x) } fi  by UnivCD
|
1. A : Type
2. b : 𝔹
3. P : A→Prop
4. Q : A→Prop
⊢  {x:A| if b→ P(x) else Q(x) fi }
|  =ext
|  if b→ {x:A| P(x) } else {x:A| Q(x) } fi  by SplitOnConclITE
|
|\
| .....truecase .....
| 5. b
| ⊢  {x@0:A| P(x@0) } =ext {x:A| P(x) }  by Analyze
|
.\
. .....falsecase .....
. 5. ¬b
. ⊢  {x:A| Q(x) } =ext {x:A| Q(x) }  by Analyze
END
```